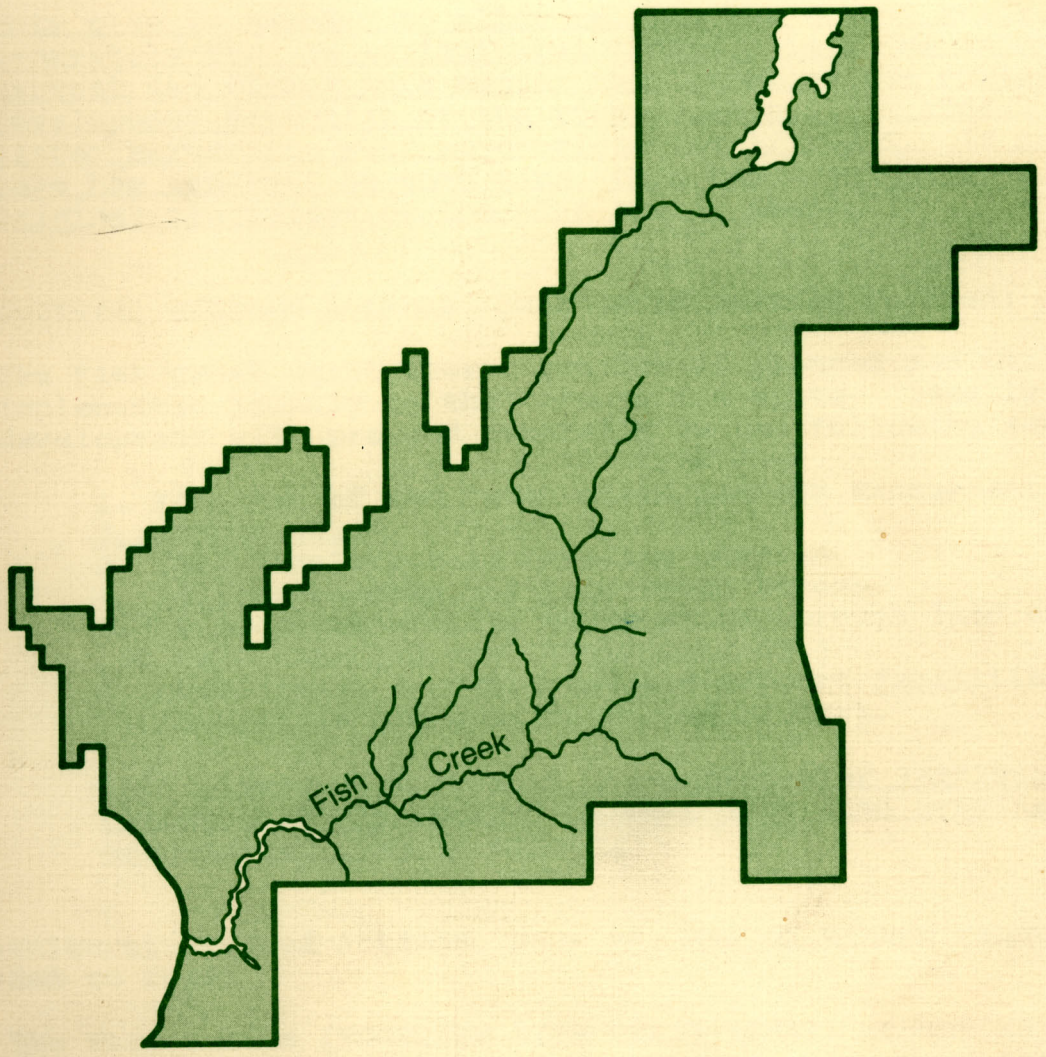
FISH CREEK
Management Plan



The
MATANUSKA–SUSITNA
BOROUGH

Alaska Department of
NATURAL
RESOURCES

ALASKA DEPARTMENT OF NATURAL RESOURCES
MATANUSKA-SUSITNA BOROUGH

AMENDMENT TO THE FISH CREEK MANAGEMENT PLAN

The following sections of the Fish Creek Management Plan are hereby amended.

Chapter 3, Management Plan, page 45, is amended by adding a new paragraph to read:

> This plan is amended to allow selling the timber prior to and separately from an agricultural rights sale. The intent is to harvest the timber in a manner that enhances the agricultural development potential of the Fish Creek project area. All timber harvesting must be completed by 1/1/1995. If no timber sale has occurred by that time, this amendment expires and the original provisions of the plan are in force.

Agricultural Planned Actions, page 46 is amended to read:

> The Fish Creek agricultural project is planned and will be implemented jointly by the borough and state. Ideally, development will proceed generally in the following sequence:
>
> 1. Adoption of the joint state/borough management plan.
> 2. Timber sale*
> 3. [2.] Completion of baseline studies.
> 4. [3.] Development of year-round access.
> 5. [4.] Enactment of a joint state/borough land sale.
> [5. LAND CLEARING AND TIMBER SALVAGE.]
> 6. Development of utilities and support facilities (utilities could be developed sooner).
>
> *All timber harvest must be completed by 1/1/1995. If no timber sale has occured by that time, the original sequence will be in effect.

Agricultural Planned Actions, page 50, Use of timber resources is amended to read:

> The farm tracts [TOGETHER WITH THEIR TIMBER RESOURCES] will be sold to the successful applicant/bidder, who could then occupy the land immendiately. Farmers will be encouraged to salvage [THE] any remaining timber. See Forestry section for details.

Agricultural guideline 1, page 51, is amended to read:

Windbreaks will be required. Their location must be shown on the farm conservation plan. These windbreaks will be rows of natural vegetation a minimum of 30 feet wide. Where the existing vegetation is overmature and sparse, wider windbreaks are encouraged. The Division of Agriculture, SCS, or the Matanuska-Susitna Borough may require wider windbreaks and planting of additional trees where necessary prior to approving the farm conservation plan. Windbreaks will be at 660 foot intervals and will run from east to west unless the Division of Agriculture, SCS, or the Matanuska-Susitna Borough requires or approves a different interval or a different orientation based on information about wind direction at the particular farm. [SELECTIVE TIMBER HARVEST WITHIN WINDBREAKS IS PERMISSIBLE FOR EITHER COMMERCIAL OR PERSONAL USE (IN ORDER TO ALLOW SELECTIVE TIMBER HARVESTING PRIOR TO IDENTIFICATION OF WIND BREAKS.) CLEARCUTTING WITHIN WINDBREAKS IS PROHIBITED. IF TIMBER IS TO BE HARVESTED BY CLEARCUTTING, WINDBREAKS MUST BE IDENTIFIED FIRST.] Pass-throughs up to 30 feet wide will be allowed, taking advantage of natural breaks in the vegetation to allow for equipment travel. Pass-throughs should be specified in the farm conservation plans. If further information shows that windbreaks are not necessary in the judgment of the Division of Agriculture or the Matanuska-Susitna Borough, farm conservation plans may be amended to allow clearing and cultivation of the windbreaks.

Forestry Management Intent, page 55, is amended to read:

There are two primary management goals for the timber in the Fish Creek unit. One is to salvage and utilize the valuable timber as part of <u>or separately from</u> the development of the agricultural tracts. Secondly, forest stands in the publicly-owned wetland buffers, recreation corridors, and the Moraine Ridge subunit will be managed to support the primary uses designated for these areas (wetland protection; recreation; and residential, commerical, and industrial development, respectively). Timber in these areas may be available for limited cutting using guidelines listed below.

Forestry Planned Actions, pages 55 and 56, paragraphs 2 and 3, is amended to read:

The <u>first</u> [SECOND] alternative is the selected alternative. This alternative was selected because <u>an agricultural rights sale has not been scheduled and is not expected to be scheduled in the foreseeable future due to the state's current economic and budget situation. The Division of Forestry has received a request for a timber sale in this area, indicating that the market for timber resources may have changed since this plan was adopted on 8/15/84. It now appears that the value of the timber resource may be sufficient to cover costs of the timber</u>

harvest and construction of winter haul roads into the area. Given the changed economic conditions, it is in the public's best interest to amend this plan to allow a timber sale to occur prior to the agricultural rights sale. Whether or not the market for timber is now strong enough to provide sufficient return to cover both the costs of timber harvest and winter access will be determined by the success or lack thereof of the proposed timber sale. However, timber harvesting must be completed by 1/1/1995. If this does not occur, this amendment is invalid and the original requirements of this plan must be followed. In that event, the second alternative will again become the selected alternative. [IT BEST MEETS THE TWO OBJECTIVES OF UTILIZING BOTH THE AGRICULTURAL AND TIMBER RESOURCES. ASSUMING THAT TIMBER WILL BE HARVESTED AND FARM LANDS DEVELOPED, THE HIGHEST RETURN FROM EACH WILL BE REALIZED. UNFORTUNATELY, IT IS NOT POSSIBLE TO OBTAIN THE MAXIMUM RETURN FROM DEVELOPMENT OF ONE OF THESE RESOURCES WITHOUT NEGATIVELY AFFECTING THE OTHER. ROADS ARE ESSENTIAL FOR AGRICULTURAL PRODUCTION. THE ECONOMIC ANALYSIS BY THE DIVISION OF AGRICULTURE ESTIMATES THAT THE POTENTIAL RETURN (PRESENT VALUE OF BENEFITS LESS PRESENT VALUE OF ON-FARM COSTS) FROM AGRICULTURAL DEVELOPMENT COULD BE SUFFICIENT TO OFFSET THE COST OF ROAD CONSTRUCTION (PRESENT VALUE OF OFF-FARM COSTS). TIMBER HARVEST ALSO CANNOT TAKE PLACE WITHOUT ROADS. THE VALUE (QUALITY, VOLUME, AND PRICE) OF TIMBER AT FISH CREEK IS INSUFFICIENT TO COVER COSTS ASSOCIATED WITH TIMBER HARVEST AS WELL AS ROAD CONSTRUCTION. TO FURTHER COMPLICATE THE PROBLEM, THE TIMBER MARKET IS NOT STRONG ENOUGH TO UTILIZE THE TIMBER WITHIN A REASONABLE PERIOD OF TIME FOLLOWING ROAD CONSTRUCTION (SUCH AS THREE TO FIVE YEARS). FULL UTILIZATION OF THE TIMBER, GIVEN THE PRESENT INDUSTRY AND MARKET SITUATION, WOULD PROBABLY REQUIRE A DELAY OF TEN YEARS BETWEEN ROAD CONSTRUCTION AND SALE OF AGRICULTURAL TRACTS. SUCH A DELAY WOULD SIGNIFICANTLY REDUCE THE NET PRESENT VALUE TO BE GAINED FROM AGRICULTURE. THUS THE ENTIRE PROJECT (BOTH TIMBER AND AGRICULTURE) BECOMES LESS FEASIBLE. LOOKING AT IT ANOTHER WAY, IF THE STATE INVESTS $17 MILLION TO BUILD ROADS IN FISH CREEK, TEN YEARS OF DELAY IN AGRICULTURAL DEVELOPMENT RESULTS IN TEN YEARS BEFORE SIGNIFICANT RETURN ON THE INVESTMENT BEGINS. SUCH A DELAY COULD BE JUSTIFIED IF THE LOSS OF RETURN FROM AGRICULTURE WERE TO BE OFFSET BY RETURN FROM TIMBER. THAT DOES NOT APPEAR TO BE THE CASE. THEREFORE, IF ROADS ARE CONSTRUCTED FOR BOTH LOGGING AND FARM USE, INVESTMENT COSTS WILL BE OFFSET PRIMARILY BY THE VALUES GENERATED BY AGRICULTURE. GIVEN THIS FACT AND THE SIGNIFICANT REDUCTION IN THE NET PRESENT VALUE OF AGRICULTURAL BENEFITS CAUSED BY A TEN YEAR DELAY, SUCH A DELAY IS NOT WARRANTED.

AT LEAST PART OF THE TIMBER CAN, HOWEVER, BE HARVESTED THROUGH SALES BY INDIVIDUAL FARMERS UNDER THE GUIDELINES IN THIS PLAN (SEE FORESTRY GUIDELINE #2 BELOW). THE DIVISION OF FORESTRY ESTIMATES THAT NEARLY AS MUCH TIMBER WOULD BE SALVAGED BY FARMERS AS COULD BE HARVESTED BY STATE AND BOROUGH TIMBER SALES IF HARVEST WERE RESTRICTED TO A THREE TO FIVE YEAR PERIOD. THE

STATE AND BOROUGH WOULD ALSO NEED TO IDENTIFY NON-CUTTING AREAS SUCH AS FARMSTEADS AND WINDBREAKS PRIOR TO TIMBER SALES. GENERALLY FARMERS PREFER TO LAY OUT FARMSTEADS AND WINDBREAKS THEMSELVES. SINCE IT IS UNLIKELY THAT PUBLIC OFFICIALS COULD SATISFY FARMERS IN THE LOCATION OF FARMSTEADS AND WINDBREAKS, AND SINCE THE VALUE OF THE TIMBER SOLD BY FARMERS IS EXPECTED TO NEARLY EQUAL PUBLIC SALES RESTRICTED TO A THREE TO FIVE YEAR PERIODS, SELLING THE TIMBER WITH THE LAND AND PROVIDING AN INCENTIVE TO ENCOURAGE FAMERS TO SALVAGE THE TIMBER IS THE BEST ALTERNATIVE.]

Forestry Guideline 13, page 58, is amended to read:

Trails: timber harvest in the corridors for the Iditarod Trail and the Yohn Lake to Susitna and Nancy Lake Loop trails will be allowed only if such harvest protects or enhances the use or visual, sound, and other characteristics of the trail. Division of Parks must be consulted in making this decision on state lands. All three trails may be crossed by logging roads. The crossings will be at approximately 90 degree angles and will be kept to a minimum. The locations will be determined in consultation with Div. of Parks.

Forestry Guideline 21, page 59, Reevaluation of timber sale potential, is repealed.

Forestry Guidelines, page 59, are amended by adding a new section of guidelines to read:

Timber Sales.

21. In the event that a timber sale does occur prior to the sale of agricultural rights, at the time of timber harvest the Divisions of Forestry and Agriculture will analyze the hazards of wind erosion and, if determined to be a problem, will take the steps necessary to prevent wind erosion.

22. If timber harvest occurs prior to the agricultural rights sale, an entire tract must be cleared prior to beginning harvest on another tract.

23. Slash and organic matter must be placed so that it does not endanger the Water Quality Standards of any state waters.

24. In addition to the normal notice requirements for a timber sale, specific notice of the sale must be given to those who commented on this amendment so that that they may comment on the more specific stipulations that will be incorporated in the sale contract.

Transportation Guidelines, page 76, are amended by adding a new guideline to read:

18. If a timber sale is held prior to sale of the agricultural rights, access may be by winter haul roads. Winter haul roads need not meet the standards for first generation roads listed above in transportation guideline 7, but must be constructed in a manner that complies with the Forest Practices Act and will not result in erosion or damage to the streams. If initial access into the Fish Creek project area is via winter haul roads, it must be from the south, across the Little Susitna River. This enables the Division of Forestry to better control unauthorized use of the winter haul roads. Authorized use of these winter haul roads will occur only at times when such use will not result in damage to streams or the roadway, generally winter. The Division of Forestry will use all feasible means necessary to prevent unauthorized use of these haul roads when such use may be damaging. Methods used may include an ice bridge or a year round bridge that is gated. The main access routes within the project area will follow the road alignment specified in this plan. The road alignment will be identified by Division of Forestry in the field. In addition, the following requirements must be met:

    a. Within the road right-of-way for the main access route a 100 foot wide corridor will be cleared and grubbed. (Grubbed for this project means that stumps are removed or are cut flush with or below ground level.)

    b. No slash or organic material piles may be buried within or left on the 100 foot road area.

    c. All grades on the main access road will be 10% or less.

Fish and Wildlife Guidelines, page 80, are amended by adding new guidelines to read:

7. During the interim period provided by the amendment to this plan, big game enhancement projects are authorized to occur in the Fish Creek management area. The intent is to utilize the timber harvest to enhance productive moose habitat, so long as this does not detract from the agricultural potential of the area or conflict with the primary intent of enhancing the area's agricultural potential through the timber sale.

Note: The policies of the Fish Creek Management Plan are contained in pages 45 - 86 in the document (the green pages). Therefore, only this section is amended. The balance of the document contains background information or elaborates on the implementation.

This amendment is adopted under AS 38.04.065 and 11 AAC 55.010-.030.

James W. Brooks

Commissioner
Department of Natural Resources

March 2, 1987
Date

FISH CREEK MANAGEMENT PLAN

Prepared By:

Southcentral District Office
Division of Land and Water Management
Department of Natural Resources
Frontier Building
3601 C Street
Pouch 7-005
Anchorage, Alaska 99510
276-2653

In Cooperation With

Matanuska-Susitna Borough
Planning Department
P. O. Box B
Palmer, Alaska 99645
745-4801

*****

Margaret J. Hayes, District Manager
Patrick C. Beckley, Planning Officer
Helen Nienhueser, Project Manager
Greg Curney, Cartographer

Planning Team

Rodney Schulling - Matanuska-Susitna Borough
Jake Shaw - Division of Agriculture
Dan Ketchum - Division of Forestry
Liz Baron - Resource Allocation Section, Division of Land & Water Mangement
Walt Garrett - Department of Transportation
Dimitri Bader - Department of Fish and Game
Pete Martin - Division of Parks and Outdoor Recreation

FINAL PLAN
August, 1984

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF LAND AND WATER MANAGEMENT

BILL SHEFFIELD, GOVERNOR

555 CORDOVA STREET
POUCH 7-005
ANCHORAGE, ALASKA 99510-7005
PHONE: (907) 276-2653

The Director of Land and Water Management finds that the Fish Creek Management Plan meets the requirements of AS 38.04.065 and 11 AAC 55.010-.030 for land use plans and does hereby adopt it as policy for state land within the planning area.

Tom Hawkins
Tom Hawkins
Director
Division of Land and Water Management

8/14/84
Date

I concur:

Esther C Wunnicke
Esther Wunnicke
Commissioner
Department of Natural Resources

8/15/84
Date

Matanuska ~ Susitna Borough

assembly memorandum

no. A.M. 84-244

APPROVED AS PRESENTED
6-19-84

from: Planning Department

date: 6/12/84

subject: Fish Creek Management Plan

Forwarded herewith is a copy of the Fish Creek Management Plan, Public Review Draft of April 1984. This document is the result of a joint planning effort of Alaska DNR, other State agencies, and Borough staffs. It is based upon guidelines within the Willow Sub-basin Plan for two management units - i.e. "Fish Creek" and "Moraine Ridge". Management plans are the most detailed plans undertaken by DNR. As you will see, the primary use of most lands in this planning area is agriculture with settlement associated with Moraine Ridge unit. The plan addresses both Borough and State lands; and if adopted, will represent official DNR and Borough policy for these lands.

The Borough Planning Commission held a public hearing on the plan during the period allowed for public and agency review and recommends its approval by the Assembly. One issue unresolved by the plan was the route to be followed by the major north-south primary road through the project. The Planning Commission, Ag Advisory Board and Planning Department staff recommends "Alternative 1" which would "hug" the base of Moraine Ridge. This is also the position taken by the State.

Based upon comments received after the Planning Commission review, the DNR Planning Team has recommended minor changes to the plan. The more significant changes are shown below:

1. The land identified around Flathorn Lake will be retained in public ownership rather than sold with a public easement;

2. Selective cutting of trees along streams within a 100' strip will be allowed;

3. MEA easements will be planned within the road ROW's; and

4. All phase II roads and all Phase III roads that provide access to the Susitna Corridor will be retained in public ownership.

The Administration recommends that the Assembly adopt the Fish Creek Management Plan, Public Review Draft dated April

1984 incorporating the Alternative 1 primary north-south road alignment and with changes mentioned above.

Since funding for road construction in connection with this project is not prioritized by the State as yet and since the latest State policy regarding agricultural development is to encourage development of previously disposed of agricultural lands prior to undertaking new projects, the Administration is recommending that the Assembly use the most flexible means of approving this plan - that is by approval of this Assembly memorandum.

Respectfully submitted,

Robert J. Stickles
Planning Director

Reviewed and approved:

Gary Thurlow, Manager

Table of Contents

List of Maps and Tables ii

Chapter 1: Introduction 1

Chapter 2: Resource Description and Evaluation 9

- Agriculture 9
- Forestry 14
- Wetlands 18
- Settlement 21
- Transportation 26
- Fish and Wildlife 32
- Recreation 36
- Materials 41
- Subsurface Resources 42

Chapter 3: Management Plan 45

- Agriculture 46
- Forestry 55
- Wetlands and Stream Corridors 60
- Settlement 64
- Transportation 70
- Fish and Wildlife 79
- Recreation 81
- Materials 86
- Subsurface Resources 87

Chapter 4: Implementation 89

Appendix 95

- Financial and Economic Analysis 95
- Alternate Master Plan 99
- Participants in Fish Creek Planning Process 109
- Excerpts from Willow Sub-basin Plan 110
- Matanuska-Susitna Borough Planning Commission Resolution 84-34 116

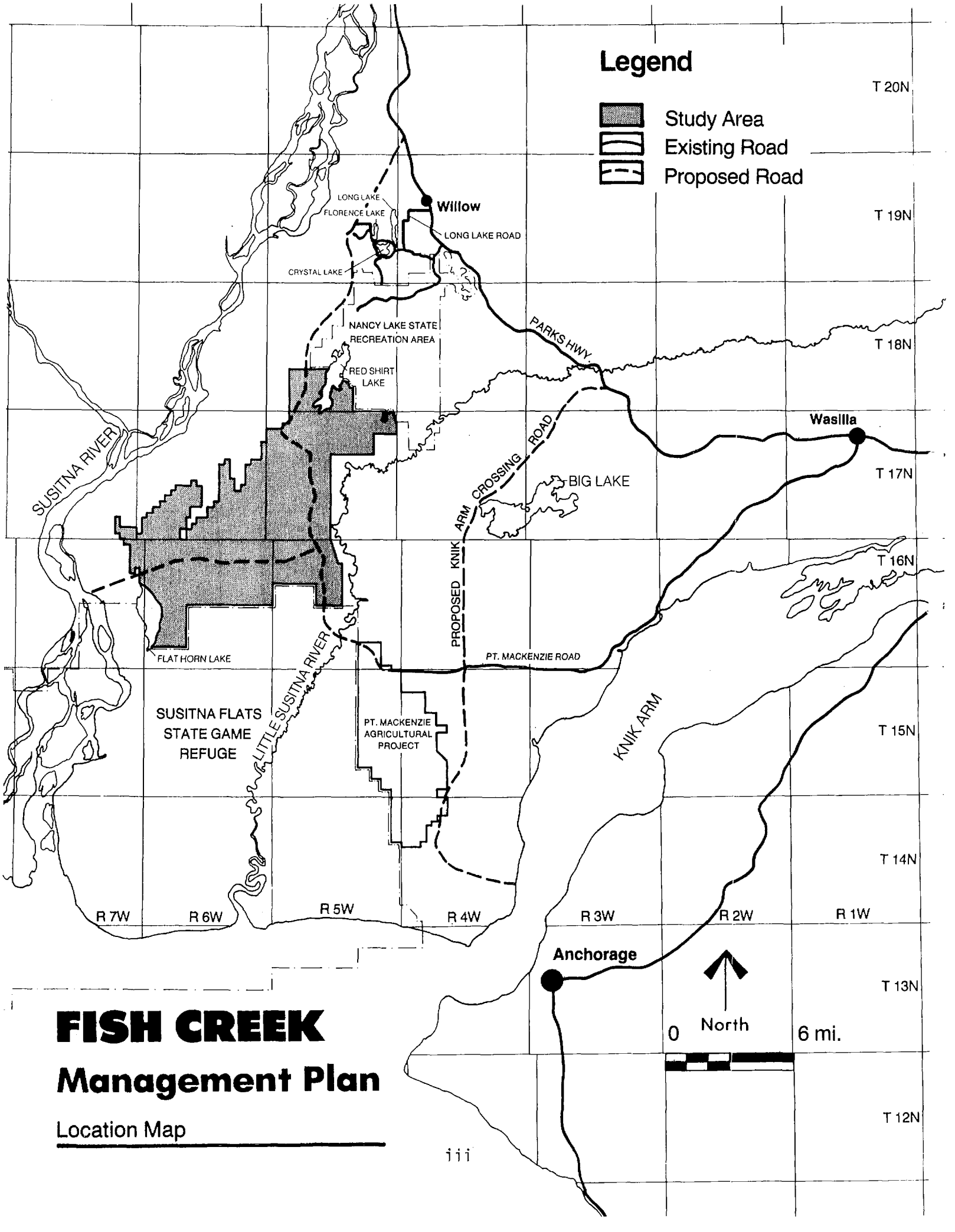
Index 118

List of Maps and Tables

Map 1:	Location Map	iii
Map 2:	Land Status	3
Map 3:	General Soil Classification	11
Map 4:	General Land Cover	15
Map 5:	Surface Hydrology	19
Map 6:	Slope	23
Map 7:	Existing Transportation	27
Map 8:	Surface Geology	43
Map 9:	Master Plan	47
Map 10:	Potential Settlement Areas, 1	68
Map 11:	Potential Settlement Areas, 2	69
Map 12:	Road Phases	77
Map 13:	North Access Options	91
Map 14:	Alternate Master Plan	105
Map 15:	Road Phases, Alternate Master Plan	107

Table 1:	Agricultural Tract Acreages	54
Table 2:	Public Recreation Lands on Lakes	82
Table 3:	Comparison of Alternatives for Access to the Project	92
Table 4:	Fish Creek Implementation Budget	94
Table 5:	Comparison of Alternative Primary Road Systems	102
Table 6:	Agricultural Tract Acreages, Alternate Master Plan	104

Figure 1:	State Planning Process	6



FISH CREEK
Management Plan

Location Map

Chapter 1
Introduction

The Fish Creek Management Plan is a plan for the use and development of approximately 45,000 acres of state and borough land located northwest of Point MacKenzie, between the Little Susitna and Big Susitna Rivers.

Study area. The land covered by this plan is located entirely within the Matanuska-Susitna Borough. The study area is bordered on the north by the Nancy Lake State Recreation Area, on the south by the Susitna Flats State Game Refuge, on the east by the Little Susitna River and on the west by Flathorn Lake. It encompasses two management units identified in the Willow Sub-basin Plan as Fish Creek and Moraine Ridge. Approximately 40 percent of the study area is state-owned and 60 percent is owned by the Matanuska-Susitna Borough.

Plan origin. This management plan represents the final product in the Department of Natural Resource's (DNR) three-step planning process. (See page 6, State DNR Planning Process). The first step, the Statewide Natural Resources Plan, is DNR's policy statement as to the allocation of state lands to various land uses and provides the framework for all resource decisions. The second step, or area plan, refines those land use allocations made in DNR's Statewide Plan on a regional basis and develops guidelines for making management decisions consistent with those allocations. The Willow Sub-Basin Area Plan, adopted in 1982 by the Department of Natural Resources and the Matanuska - Susitna Borough, is the area plan encompassing Fish Creek. The third and final step, management plans, develops site specific land use allocations within the scope of the guidelines set forth in the area plan.

Effect of plan. The Fish Creek Management Plan is a joint plan developed by the Department of Natural Resources and the Matanuska-Susitna Borough for state and borough lands. It becomes official policy for the management of state lands when approved by the director of the Division of Land and Water Management and concurred in by the Commissioner of the Department of Natural Resources and for borough lands when approved by the Matanuska-Susitna Borough Assembly. The Assembly has approved the plan with an Action Memorandum. The plan has no direct effect on private lands.

Why is a plan needed? The Willow Sub-Basin Area Plan identified four primary uses for the Fish Creek unit: 1) agriculture, 2) fish and wildlife, 3)watershed and (4) recreation. These uses are not always compatible with each other. With careful planning, however, these uses can co-exist in the Fish Creek study area.

1) Agriculture

The Fish Creek project area includes the last largely contiguous block of public land with soils having agricultural capability east of the Susitna

River. It contains approximately 16,000 acres of class II and III soils. Additionally, its proximity to the Point MacKenzie agricultural project (located approximately three miles to the southeast) adds considerable interest to the agricultural development of Fish Creek.

2) Fish and Wildlife

Fish Creek and its tributaries serve as a spawning, rearing, and migration corridor for rainbow trout and three species of salmon. The major lakes provide habitat for several species of fish as well. These same drainages and lakes provide habitat for moose, black bear, waterfowl, and furbearers as well as numerous small game species.

3) Watershed

As noted above, the creeks and lakes in Fish Creek provide an important link in the life cycle of various species of fish and wildlife. Additionally, the wetlands serve important functions in stabilization of water levels and filtering of nutrients.

4) Recreation

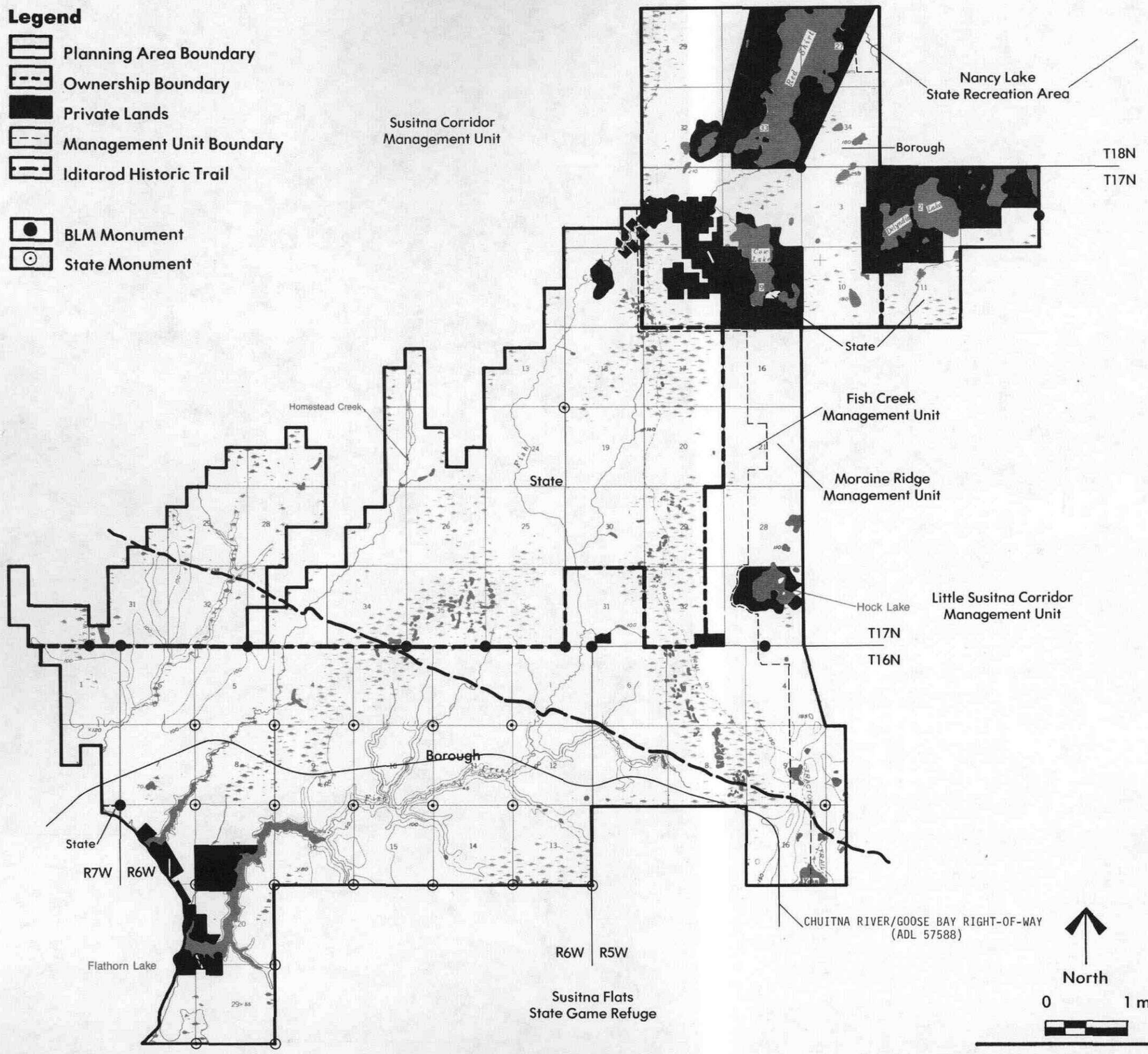
The Iditarod Historic Trail bisects the project area. Numerous secondary trails also exist throughout Fish Creek. The unit contains a number of lakes in addition to Fish Creek and two other streams. Various locations contain the potential for high public use, should access develop.

5) The major potential conflict among these uses is between agricultural development and fishery production in the streams and lakes. The intent of this plan is to provide for agricultural development in a manner that does not diminish the fisheries habitat.

The initial impetus for the Fish Creek Management plan grew out of a previous state goal of transferring large amounts of agricultural land into private ownership. The agricultural soils in the Fish Creek area were designated for agriculture in the Willow Sub-basin Plan and there is significant interest from the agriculture community and the Matanuska-Susitna Borough in developing this area as soon as possible. Therefore, a joint state-borough plan was initiated in 1982.

Since this plan was begun, the state has revised its agricultural policy to the following: "the state's goal for 1990 should be to diversify and strengthen the state's economy by increasing the availability of competitively priced Alaska food products. This can be accomplished through pursuit of the following objectives.

- Encouraging expanded production of competitively priced farm products from existing agricultural lands
- Increasing the number of acres available for agricultural production
- Preserving options for in-state market expansion and future exports" (from Division of Agriculture's December, 1983 report to the Governor: Agriculture in Alaska: A Plan for the Future, page 3.)



FISH CREEK
Management Plan

Land Status

The report goes on to recommend actions to implement those objectives, with emphasis on the first objective for fiscal years 1985-87.

Additionally five major factors complicate the near term development of Fish Creek as an agricultural project despite its abundance of high quality soils. Those factors are:

1. Lack of physical access and the high cost of developing access.

2. The limited ability of the Alaskan economy to successfully absorb another large agricultural project while still developing the Point MacKenzie and Delta projects.

3. Existence of an extensive wetland area in the midst of the agricultural area - which fragments the usable agricultural soils.

4. Existence of an extensive stream system which produces anadromous fish and further fragments the agricultural soils.

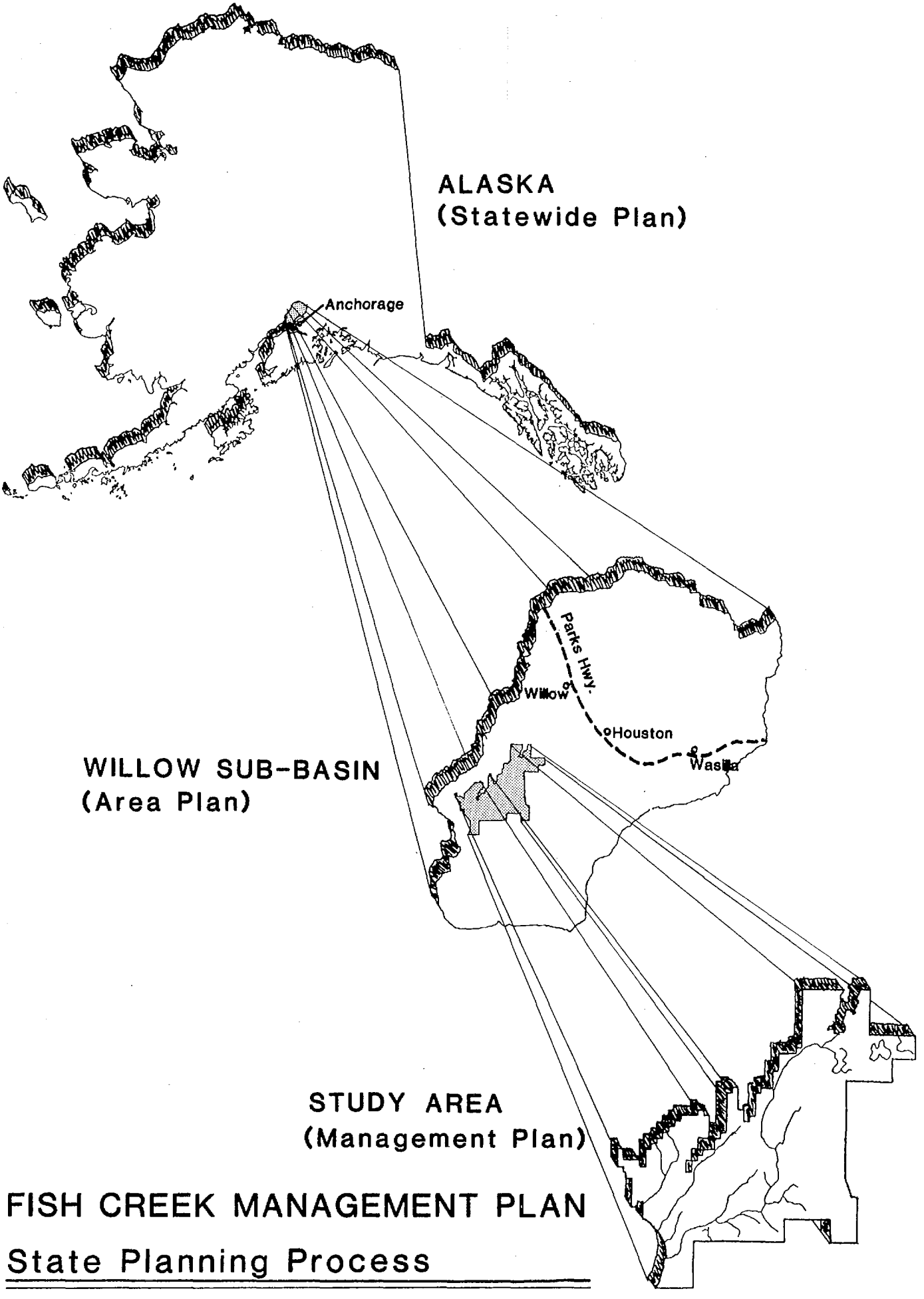
5. Timber stands on the area are marginal for commercial harvest. Timber harvest probably will not materially enhance development of the area.

These factors make it imperative that Fish Creek be developed under the right economic conditions. Because of the high cost of developing access to Fish Creek, it is not included in the state administration's planned actions for FY 85 through FY 87.

The intent of both the state and borough is to reserve the Fish Creek area for agricultural development. The purpose of this plan is to prescribe a blueprint for that development when it occurs and serve as guidance for management of the area in the interim.

The planning process: The Willow Sub-basin Plan identified primary and secondary land use allocations along with a set of management goals, objectives and management guidelines to govern those uses. This plan is consistent with the Willow Sub-basin Plan but is more detailed. The most important guidelines from the Willow Sub-basin Plan are incorporated in this document, but for complete guidance the reader must also consult the Willow Sub-basin Plan.

During the management planning process, an interagency planning team has taken a more detailed look at the land use allocations made in the Willow Subbasin Plan and developed a master plan that includes agricultural tract layout, transportation corridors, publicly-owned stream corridors and wetlands, and recreation sites. This was accomplished through a series of workshops involving agency representatives from the Soil Conservation Service, Matanuska-Susitna Borough, Department of Transportation and Public Facilities, Department of Fish and Game and Department of Natural Resource's Divisions of Agriculture, Forestry, Parks, and Land and Water Management.



FISH CREEK MANAGEMENT PLAN

State Planning Process

Following the conclusion of this step, site design alternatives were prepared, and public meetings were held in Wasilla and Anchorage. The master plan, which appears in this document, is based on comments received at those public meetings. Compromises were made as necessary when conflicting comments were received.

The planning team then developed a set of draft management guidelines that would aid in managing the resources in the Fish Creek area. These were circulated for interagency review and revised on the basis of the comments received.

An interagency review draft of the plan was published in October, 1983, and circulated for comment to state, borough, and federal agencies. Revisions to the draft plan then resulted in a public review draft which was made available to all property owners in the area and all known interest groups as well as the general public. Two public meetings were held in Palmer and Anchorage to receive comments. Final revisions were made, and the plan was approved by the director of the Division of Land and Water Management and the Matanuska-Susitna Borough Assembly.

The above described process satisfies the requirements for land use plans under Chapter 55 of Title 11 of the Alaska Administrative Code.

Consistency with the Coastal Management Plan. The Matanuska-Susitna Borough reviewed the agency draft of this plan and found it to be conceptually consistent with the general intent and policies of the Matanuska-Susitna Borough Coastal Management Plan. However, specific consistency determinations can only be made as part of the agency review process based in turn on specific project proposals.

Follow-up steps. Prior to sale of the agricultural lands, a number of steps are necessary. The major step is a decision by the Governor and Legislature to fund the construction of roads into this area.

A cost-benefit analysis comparing the costs of road construction in the area between the Little Susitna and Big Susitna Rivers with the benefits from agriculture, timber, and recreation will be done by the U.S. Department of Agriculture by fall, 1984. The information on benefits will be supplied by the Departments of Natural Resources (DNR) and Fish and Game. The information on road costs will be supplied by the Matanuska-Susitna Borough and on other costs by DNR. The conclusions of the analysis will be useful to decision-makers in deciding when funding for road construction and agricultural development in Fish Creek is appropriate as sound public policy.

Additionally, detailed data collection studies should be performed (see Chapter Four, Implementation). These studies include a sand and gravel inventory, test drilling for ground water, a water quality evaluation, and hydrologic and meteorological (wind velocity and direction) studies, archeological investigations, and baseline studies on wildlife and pesticide residues.

Slight adjustments to the land use designations made in the Willow Sub-basin Area Plan are recommended by this plan based on a more detailed analysis of

the data. On state land these revisions will become effective with adoption of this plan and will be reflected as classifications on the state's land status plats.

See Chapter Four for additional discussion of implementation steps.

Changing the plan. Under Division of Land and Water Management and Matanuska-Susitna Borough policy, this plan may be changed when conditions warrant.

Major Changes - includes changes to the intent of planned uses or guidelines; major changes require amendments and are subject to the same process used in developing the original management plan including agency and public review. On state land all amendments are approved by the Director, Division of Land and Water Management and concurred in by the Commissioner, Department of Natural Resources. On borough land approval of major changes will be by the Borough Assembly.

Minor changes - include changes necessary for clarification, consistency, or to facilitate implementation of this plan. Unlike major changes, minor changes do not require public review and may not require interagency review.

Special Exceptions - may occur only when compliance with the plan is impractical and an alternate procedure can be used which conforms to the intent of this plan. Special exceptions require a written finding by the District Manager for state lands and the borough Manager for borough lands explaining why they are necessary, the course of action to be followed, and how it meets the intent of the plan.

Organization of the plan. The plan consists of three chapters following this introduction. Chapter Two is a description and evaluation of each of the resources found in the study area. Chapter Three presents the management decisions, including managemant guidelines, again organized by resource. Chapter Four discusses implementation, which includes some issues that can only be resolved during that stage.

Chapter 2
Resource Description and Evaluation

Agriculture

Resource Description

Soils. The Fish Creek study area contains approximately 16,000 acres of Class II and III soils according to a soils inventory in 1973 by the Soil Conservation Service. Class II and III soils are soils with high capability for agriculture. Soil depth in the area reaches 30 inches. The study area also contains a limited amount of Class IV soils which can be used for agriculture with proper management. The primary limitation of the Class IV soils in the study area is steepness. A generalized soils map is on page 11. For a more specific map, see the U.S. Department of Agriculture's 1973 publication: Soils Survey, Susitna Valley, Alaska.

Climate. The climate of Fish Creek is similar to other areas in the Matanuska and Susitna Valleys. The average number of frost free days at Wasilla, the closest weather station, is 111 days. In 1982 there were an average of 2143 growing degree days (base 40°F) at Wasilla. The average temperature in July is 59; in September it is 49. In Skwentna, on the other side of the Fish Creek Unit, the average July temperature is 58 and the average September temperature is 46. Average annual precipitation at Wasilla is 14.17 inches (8.84 inches between April and September) and at Skwentna, it is 27.89 inches (14.95 inches between April and September). While weather at these stations will not be exactly the same as in the Fish Creek area, this information gives an indication of what can be expected. Microclimates often affect production within relatively small geographical areas. Direction of slope (i.e., exposure) and direction, duration, and velocity of prevailing winds influence the growing season.

Water. Precise data on quality and availability of ground water and the quality of surface water does not currently exist. Visual observation shows much surface water in the many lakes and swamps throughout the area, but these are not likely to be practical sources of water for agricultural development. According to Larry Dearborn and William Long of Division of Geological and Geophysical Surveys: "The availability of ground water through drilled wells in the Fish Creek tract could be severely limited by subsurface conditions that may occur here. The presence of either permafrost at depth or the Bootlegger Formation, a commonly thick sequence of silt and clay, could preempt the occurrence of aquifers at relatively shallow depth. In addition, it appears possible that deeper aquifers, if present, may contain brackish water. Test drilling will be needed to demonstrate what subsurface conditions are actually like in this area." (from Alaska's Agriculture and Forestry, Chapter 7 "Water Resources", page 57).

Resource Evaluation

The Fish Creek unit contains the last large block of undeveloped agricultural (Class II and III) soils east of the Susitna River. Generally, the climate is suitable for farming. The availability and suitability of ground water is not known. The streams and wetlands form an extensive and complex surface drainage system. Mature upland mixed forest stands of spruce, birch, and poplar indicate the presence of well drained soils on upland sites.

The initial cost of farm operation requires a reasonably quick rate of return and therefore forces the developer to utilize only those soils with the greatest potential for production of agricultural crops. For this reason, emphasis is placed on bringing only Class II and III soils into production. Farmers may choose to plant Class IV soils in permanent crops (hay, pasture), which may contribute positively to the economics of their operation.

The general landscape of the Fish Creek project area is complex due to the nature of the drainage patterns and the random location of muskegs and poorly drained soils. As a result the parcel boundaries meander. This affects the organization of the farm units and adds to the cost of the surveying the tracts as well as to the cost of road construction.

The location of the Fish Creek unit, three miles northwest of the Point MacKenzie agricultural project, increases its attractiveness. However, Fish Creek is currently inaccessible by road. The benefits of developing the area for agriculture and public use need to be weighed against the costs of road development.

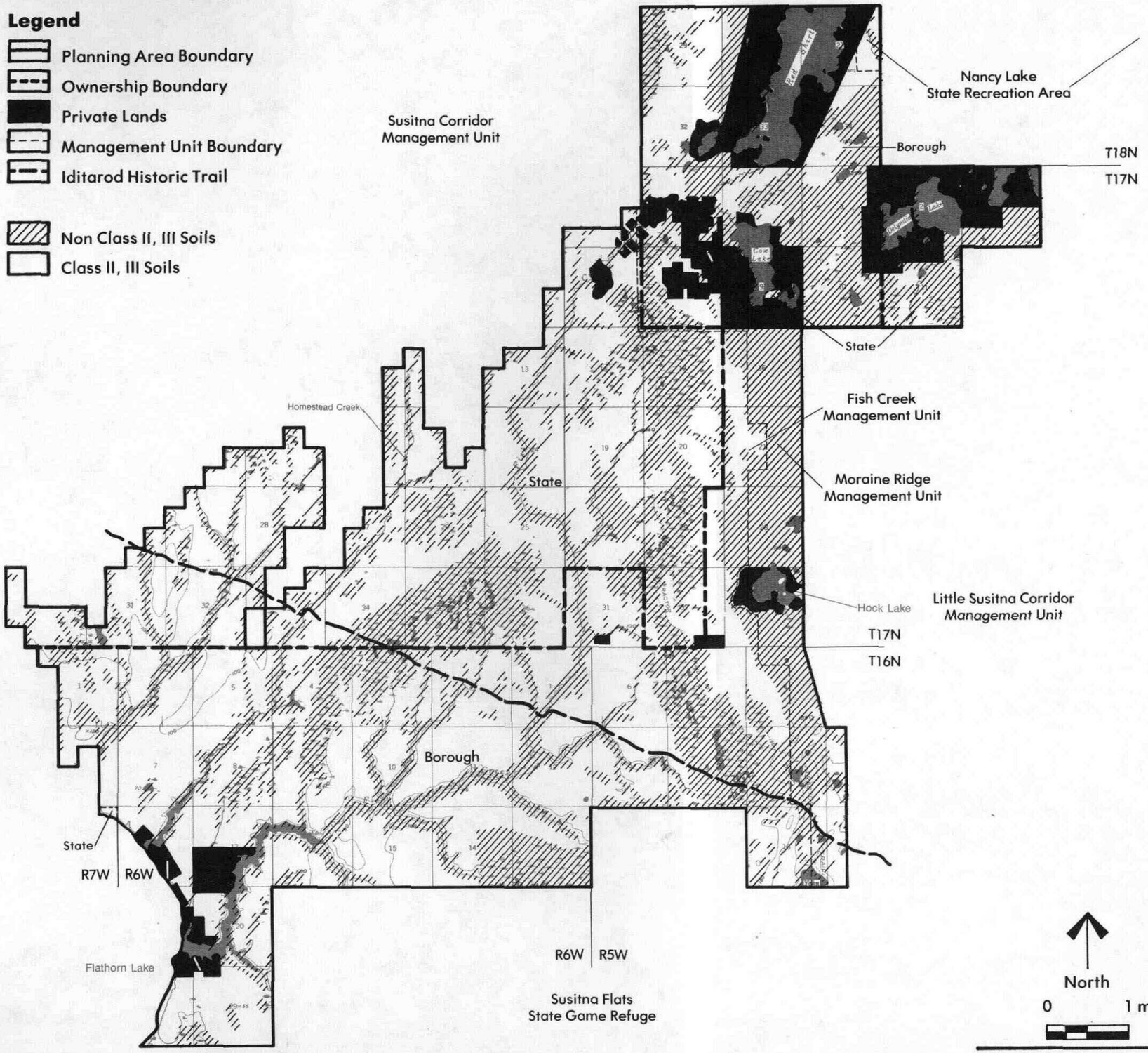
Financial and Economic Analysis. The Division of Agriculture has analyzed the economic potential of an agricultural project at Fish Creek in a draft report entitled Fish Creek Agricultural Area Financial and Economic Analysis. This report is available from the Division of Agriculture (Box 949, Palmer, Alaska 99645-0949) and is summarized in the appendix of this plan.

The report makes a number of assumptions about what could happen:

1. Farms at Fish Creek will grow a mixture of crops (potatoes, vegetables, barley, and hay) and will be between 80 and 600 acres in size;

2. The cost of agricultural rights will be $100 an acre;

3. 1000 acres of potatoes will be grown at Fish Creek which by the year 2000 may be one-half of the acreage needed to meet in-state demand for potatoes;



FISH CREEK
Management Plan

General Soil Classification

4. Vegetables will be produced on 150 acres;

5. Remaining agricultural soils will be planted in hay, grain or pasture;

6. Everyone who purchases a parcel will be a serious farmer interested in getting his tract into production as quickly as possible;

7. Sixty percent of road construction and maintenance costs will be allocated to agriculture (this is an arbitrary figure that assumes that other benefits will be derived from road construction - primarily recreational);

8. Road costs were estimated at approximately $19.2 million spread over two phases and road maintenance at $8000 per mile per year; phase 1 roads were assumed to be built before the sale of agricultural tracts and phase 2 roads in the fifth year of development.

9. One-third of the farmers will elect to harvest their timber and take advantage of their option to delay their development schedules three years, resulting in harvest of one-third of the timber on the tracts.

Based on the above assumptions, benefits and costs were calculated for a 47 year period and the net benefits (benefits minus costs) were calculated for each year. The overall average annual rate of return for the 47 year period is 9.4 percent. (This assumes that all project investment and operating costs have been recovered and that the project could in addition pay 9.4 percent annual interest for the use of the capital.)

If 100% of the road construction and maintenance costs were allocated to agriculture, the overall average annual rate of return would be 7.31 percent. If there were no delay for timber harvest and all purchasers put their farms into production very rapidly, the average rate of return would be 11.70 percent if 60 percent of road costs were allocated to agriculture. This decreases to 8.9 percent with 100 percent of road costs allocated to agriculture. (The cost of providing power to the farms is not included. The Matanuska Electric Association estimates this cost as $6.27 million including 15 miles of transmission lines, 55 miles of three phase distribution lines, and a substation.)

Because a change in assumptions could significantly alter the conclusions, it is important to do a sensitivity analysis that varies the assumptions on rate of development, amount of acreage in potatoes and vegetables, proportion of road costs charged to agriculture, and prices of farm products. Such a sensitivity analysis would show what happens to the overall average rate of return under different assumptions such as a slower rate of development or fewer acres in potatoes.

Forestry

Resource Description

There are approximately 15,900 acres of spruce, birch, and cottonwood stands in the Fish Creek Unit. The average acre contains approximately 400 trees ranging in size from 10 inches d.b.h. (diameter at breast height) up to 24 inches d.b.h., with some black cottonwood trees reaching 27 inches d.b.h. The stands are typical of the Susitna River Valley.

Volumes. In some areas, trees over five inches d.b.h. reach the 1,000 cubic feet per acre level. For trees smaller than five inches d.b.h. there are no reliable estimates of the volume and/or weight of their biomass. In general, stand volumes in the unit are better than many in the overall region but are not as a rule among the highest in volume.

Commercial timber. White spruce and paper birch, with some cottonwood, comprise the potential timber harvest. Based on trees five inches d.b.h. and larger, the area contains about 20,000,000 cubic feet of birch or approximately 220,000 cords of firewood. Based on trees 8" and larger, the area contains 467,000 cubic feet or 1868 mbf of white spruce.

Non-commercial forest. Black spruce covers approximately 4,900 acres and would yield 72,000 cubic feet of wood. In addition, there are 700 acres of riparian willow/alder for which volumes have not been estimated.

Resource Evaluation

Quality and quantity of timber. The majority of the timber is mature or over-mature birch and aspens with some spruce. The volumes appear to be lower than those of Point MacKenzie, and in the older stands there is a high incidence of disease which further reduces the commercial volumes.

Access. Current base rates for the value of standing timber to the owner are established on a premise of reasonable cost of access. At present no all-season access to the area exists, and the Fish Creek Unit's location makes the prospect of constructing logging roads economically unattractive, since the potential harvest would not sufficiently compensate the logger for the costs involved. If roads already existed the value of the standing timber would be significantly higher; or were there a strong market for the wood the cost of access would become correspondingly less prohibitive. At present, however, there is not a demonstrably strong market and the area's loggers do not presently have the production capabilities to move large enough quantities of wood fast enough to utilize the area's timber in less than ten years following road construction.

The lack of road access makes a state or borough timber sale in the Fish Creek area impractical at present. The limited demand and production capabilities makes a sale impractical after road construction and before

Legend

- Planning Area Boundary
- Ownership Boundary
- Private Lands
- Management Unit Boundary
- Iditarod Historic Trail

- Non Forest
  - Shrub, Alder, Willow, Bog
- Closed Forest
  - Birch, Aspen, White Spruce, Black Spruce, Cottonwood

Susitna Corridor Management Unit

Nancy Lake State Recreation Area

Borough

T18N

T17N

State

Fish Creek Management Unit

Moraine Ridge Management Unit

Homestead Creek

State

Hock Lake

Little Susitna Corridor Management Unit

T17N

T16N

Borough

State

R7W | R6W

Flathorn Lake

R6W | R5W

Susitna Flats State Game Refuge

North

0 1 mi.

FISH CREEK
Management Plan

General Land Cover

sale of the agricultural tracts. If agricultural development is significantly delayed and the demand and production capabilities increase, the feasibility of a state and/or borough timber sale could change.

In any event, the unit's timber resource will be of considerable value to residents and farmers in the form of houselogs, fuelwood, and rough cut (unplaned) lumber. If the new owner wishes to farm his land he could cut the timber and use it in these ways, or he could burn it or sell it on the stump.

Relationship to other values. Forests of the unit provide important habitat for valuable fish and wildlife resources, including game and non-game species. Harvest of timber resources and/or non-harvest manipulation of forest vegetation will result in an increase in the acreage of more productive habitat conditions for moose and in the generally recognized, productive conditions (edge effect) associated with edges of adjoining stands. Either operation can be conducted so as to result in habitat enhancement without unacceptable impacts on other environmental conditions.

Forests of the unit contribute to the appeal of the area for various dispersed recreation uses.

Wetlands

Although the Fish Creek Management Unit contains approximately 16,000 acres of prime agricultural lands it also contains approximately 10-12,000 acres of wetlands. These wetlands occur in large areas in a dendritic pattern along the lateral drainages of Fish Creek. The wetlands provide the following important environmental functions:

a) Water quality: wetlands serve to filter nutrients and sediment from upland run-off.

b) Water supply: wetlands serve to stabilize water supply by retaining excessive water during flooding and recharging groundwater during dry periods.

c) Habitat/recreation: wetlands provide important feeding, nesting,and breeding grounds for many wildlife and fish species; related recreational use is also important.

The wetlands in the Fish Creek Unit are particularly important to the quality of water in Fish Creek itself. Returning salmon runs to this creek exceed 7,000 fish annually. In addition, when agricultural development occurs, the wetlands will become a major waterfowl hunting area for Anchorage and Matanuska-Susitna Valley residents.

Legend

- Planning Area Boundary
- Ownership Boundary
- Private Lands
- Management Unit Boundary
- Iditarod Historic Trail

- Primary Stream
- Secondary Stream
- Wetland Drainage
- Wetland

Susitna Corridor Management Unit

Nancy Lake State Recreation Area

Borough

T18N

T17N

State

Homestead Creek

Fish Creek Management Unit

State

Moraine Ridge *Management Unit*

Hock Lake

Little Susitna Corridor Management Unit

T17N

T16N

Borough

State

R7W | R6W

Flathorn Lake

R6W | R5W

Susitna Flats State Game Refuge

North

0 1 mi.

FISH CREEK
Management Plan

Surface Hydrology

Settlement

Resource Description

A large percentage of the study area is suitable for settlement. Past state and federal land disposals have placed most of the land around the larger lakes in the study area in private hands. Cabins have been built on some of these parcels, at Flathorn, Redshirt, Cow, Delyndia and Hock Lakes.

Much of the remaining land that is suitable for settlement in the Fish Creek unit consists of Class II and III soils which are also suitable for agriculture. The priority for these lands was determined to be agriculture by the Willow Sub-Basin Plan. Therefore, this discussion of settlement land focuses on the lands on Moraine Ridge.

The Moraine Ridge subunit is on the eastern edge of the study area. It is situated south of the Nancy Lake State Recreation Area, north of the Susitna Flats State Game Refuge, and west of the Little Susitna River corridor. The boundaries of this unit have been redrawn to exclude most Class II and III soils thereby conforming to the boundaries of the proposed agricultural tracts.

The land uses recommended for this unit in the Willow Sub-basin Plan are settlement, forestry (both commercial and personal use), fish and wildlife and recreation.

The borough owns most of this unit. The state owns a little over a section south of Delyndia and Butterfly Lakes and a few other parcels.The remainder, approximately 2500 acres, is privately owned, including about 600 acres owned by Cook Inlet Regional Corporation.

Elevations range from 150 to 430 feet above sea level. Five major lakes lie either partially or entirely within the unit. Vegetation along the ridge itself is in a climax condition common to well-drained uplands found in southcentral Alaska, which includes mature stands of birch, aspen, and spruce. The understory consists of second growth birch and spruce with patches of devil's club and native grasses. Vegetation along the toe slopes and in the northern portion of the unit includes black spruce interspersed with muskeg.

Soil and slope characteristics separate the Moraine Ridge area into three topographic areas: 1) the toe slopes along the western edge, 2) the northern portion, and 3) the ridge itself. (See the general soil classification and slope maps.) The toe slopes consist almost entirely of Class II and III soils and form a transition zone between the ridge to the east and the wetlands to the west. Much of this area has been included in agricultural tracts and the Fish Creek Unit. The northern portion consists of islands of Class II-VI soils isolated by wetlands. The ridge consists of well-drained upland soils with a gravelly sub-base.

At present, summer overland vehicular access from the east is not possible because there is no bridge across the Little Susitna River. Following winter freeze up, overland access is possible by snowmachine from the south via three routes: 1) an existing tractor trail extending five miles from the Little Susitna River, 2) from the east via a cleared township line extending from the Big Lake Road approximately four miles to Moraine Ridge, or 3) from the north seven miles from the Long Lake Road. Air access is provided by four lakes in the north and by Hock Lake, located in the center of Moraine Ridge.

Resource Evaluation

Soil capabilities. Soil types and slopes are discontinuous. Patches of Class II and III soils are too small and discontinuous to make most of this area feasible for agriculture, while a good portion are so steep that development of these soils for agricultural purposes could result in erosion.

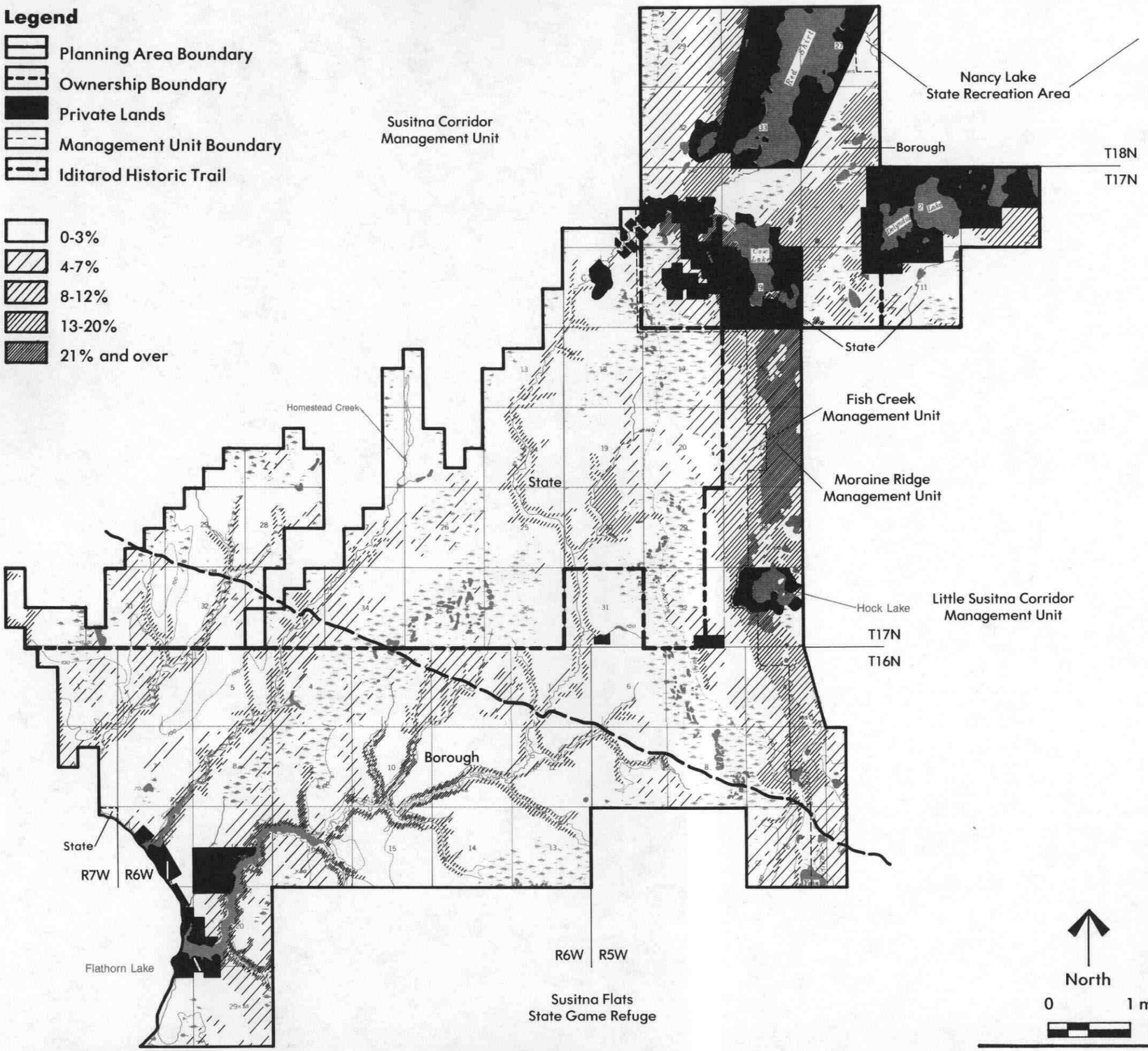
Water. Subsurface water potential for the Moraine Ridge Unit is not known.

Vegetation. On the well-drained upland patches, potential exists for management of the timber resources for selective cutting. Exact timber volumes are not known; on-site analysis, however, has shown that existing stands of timber are too small to warrant a large-scale commercial timber sale. Due to the maturity of the timber stands, available food supply for moose and bear is minimal, and the timber serves mainly as escape cover for these species. With appropriate forest management practices, this unit could serve as a supply for small-scale house log, saw log and personal use firewood demands, while increasing moose and bear feed.

Topography. The discontinuous slopes and exposure of Moraine Ridge are generally unsuited for agriculture except along the western toe slopes, where a combination of gentle slopes, good exposure, and large blocks of Class II and III soils make commercial agriculture feasible. (These lands have been included in the agricultural tracts and the Fish Creek unit.)

Settlement. Moraine Ridge contains a high potential for residential and related development. Varied topography would provide for natural visual and sound buffering, in addition to providing excellent views of Big Lake to the east, Flathorn Lake, the Susitna River and Mount Susitna to the west, and Denali (Mount McKinley) to the north.

Geographic location. The nearest existing population centers are Big Lake (seven miles east), Willow (12 miles to the north), and Point MacKenzie (eight miles to the south).



FISH CREEK
Management Plan

Slope

Proposed transportation routes. The Department of Transportation and Public Facilities has identified two major regional road corridors that traverse the project area: 1) the Chuitna River - Goose Bay corridor, (ADL 57588), which extends west across the Big Susitna River to Tyonek, and 2) a corridor extending from the existing Point MacKenzie Road north to the Parks Highway at Willow. These two corridors intersect at the southern end of the Moraine Ridge unit. A route for a future railroad extension to Point MacKenzie has been suggested through the unit, but whether and where it will be built are highly speculative at present.

Farm service/commercial center. Development of the area's agricultural potential is expected to eventually generate a need for development of a farm service center within the unit. Such a center could provide feed, seed, fertilizer, farm machinery, freezer plants, and other farm needs, as well as commercial support facilities for the potential settlement areas located along the ridge. In addition, there may eventually be a demand for storage, processing, and shipping facilities for agricultural products.

Transportation

Description of Existing Transportation Systems

To date transportation development in the unit has been piecemeal at best, with the Little Susitna River severely hampering overland access west. Private land along Flathorn Lake and open-to-entry parcels surrounding lakes and along Fish Creek in the northern portion of the unit have dictated the primary need for access routes in the area.

Existing transportation: man-made. An old tractor trail leading to a homestead at Flathorn Lake and believed to have been built in the 1950's is the only known attempt within the project area at constructed vehicular overland access from the Little Susitna River west. This route is now impassable because of heavy second growth vegetation. In addition, road fill at stream crossings has eroded, making those crossings impassable.

The only other known route cleared specifically for transportation purposes is the historic Iditarod Trail. This route initially served as the mail route from Anchorage to lands west and runs diagonally through the unit from the Little Susitna River to Susitna Station. The trail at present is in poor condition and receives minimal use. However, the Iditarod Trailblazers plan to upgrade this trail in the near future.

Numerous seismic lines crisscrossing the unit and a cleared township line (between Townships 16 and 17 North) offer other man-made overland routes through the unit.

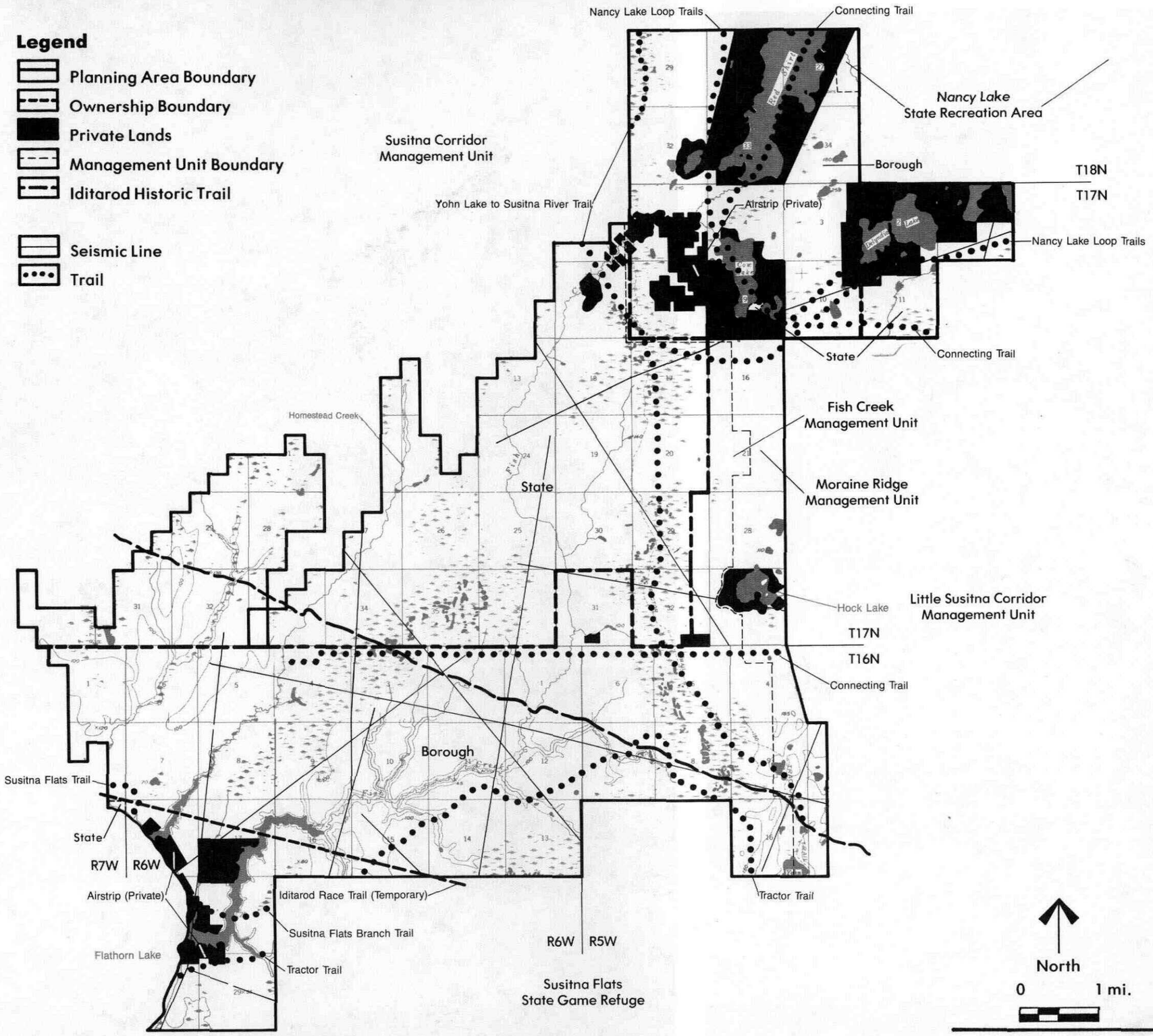
Three private airstrips have been built in the unit to provide access to parcels along Flathorn (2) and Redshirt (1) lakes. (See the Existing Transportation Map, page 27)

Existing transportation: natural. Contiguous wetlands and stream corridors provide winter north/south access within the unit. Additionally, year-round air access is possible via the numerous lakes within the unit.

Current uses. The majority of existing transportation routes within the unit are useable only during winter months. The Iditarod Race Trail follows a seismic line that runs from the Little Susitna River to Flathorn Lake. From Flathorn Lake the trail follows wetlands to Susitna Station, where it crosses the Susitna River.

Other seimsic lines provide potential access but are not used to any extent, partially because of the difficulty of crossing streams.

The cleared township line receives moderate use, since it provides a corridor from the Big Lake Road, over Moraine Ridge, to the Susitna River.



FISH CREEK
Management Plan

Existing Transportation

In the northern portion, winter access is possible via trails from the Long Lake Road into the Redshirt Lake area.

Adjacent winter transportation routes. A winter haul road is constructed annually for shipment of materials from Anchorage to Tyonek and the Beluga coal fields. This haul road runs south of the Fish Creek unit in the Susitna Flats State Game Refuge. Four-wheel drive winter access to Flathorn Lake is possible from this haul road.

Transportation Needs

Two levels of transportation systems were considered in development of road layouts within the Fish Creek unit: regional, or primary road systems, and local, or secondary road systems.

Regional (primary) system: east/west route. With the anticipated development of the Beluga coal fields, there may be need for an overland transportation system. If the Knik Arm crossing from Anchorage to Point MacKenzie is built, it would make more realistic a western expansion of the existing intrastate transportation network.

The Department of Transportation and Public Facilities (DOT) has evaluated the potential for expansion west and has performed preliminary horizontal alignment studies. The result of these studies is the Chuitna River-Goose Bay corridor [shown on state land status plats as an a right-of-way application (ADL 57588)]. This corridor was re-evaluated during the Fish Creek plan design process and was rerouted somewhat north of the existing application. The realignment fits better with the proposed tract layout.

The basic criteria used by DOT in identifying this alignment were:

- to stay north of the Susitna Flats State Game Refuge in order to take advantage of more gravelly, stable soils and to avoid Cook Inlet tidal influences when crossing the Susitna River; and

- to stay as far south as possible in order to provide a more direct route from Anchorage to Tyonek.

North/south route. A Knik Arm crossing would increase the potential for an intrastate road corridor connecting Point MacKenzie with points north on the Parks Highway. Several alternative corridors were identified by Department of Transportation for this purpose. One, a direct route to Fairbanks, lies just west of Moraine Ridge, in the agricultural subunit of Fish Creek. Another alternative known as the Houston corridor, provides the shortest access to the area around Big Lake where most population growth is likely to occur. This is currently the north approach to the Knik crossing site that is preferred by the Department of Transportation and the Matanuska-Susitna Borough. The Department of Natural Resources prefers the route through Fish Creek. In any case, if the Knik Arm crossing is built, it is probable that there will eventually be a highway from Point MacKenzie through Fish Creek to Willow.

Alternate north/south routes within the Fish Creek unit. The Fish Creek planning team considered two alternative locations for the north-south corridor through the study area: (1) along the western toe slopes of Moraine Ridge, and (2) further west in the agricultural subunit.

Factors considered in evaluation of these two alternatives are:

- soils;
- slope;
- stream crossings;
- distance;
- cost;
- overall alignment;
- overall compatability with the proposed land use; and
- effect on private lands.

See Chapter Three for further discussion of these two alternatives.

Local (secondary) system. A secondary road system is needed in the Fish Creek unit to provide access from primary (regional) roads to farm tracts.

In development of a secondary road system for Fish Creek the following general design criteria was used:

- Spacing of primary/secondary road intersections should be at least two miles apart to provide for proper signing on the main road for future interchanges.

- Stream crossings should be minimized.

- All stream crossings should be perpendicular to the water channel.

- Routing of roads parallel to streams should be avoided.

- Sufficient space should be left on either side of road for buffers when routing near streams or wetlands.

- Roads should be designed to serve as large an area as practicable with as small an expenditure as possible.

- Poorly drained areas should be avoided.

- A free flowing circulation pattern should be provided.

Proposed Alaska Railroad route. In anticipation of a potential industrial port facility at Point MacKenzie, the borough has studied corridors that would provide a more direct route by rail from points north to Point MacKenzie. The borough's study recommended a route traversing Moraine Ridge from southeast to northwest.

Susitna hydroelectric project transmission line. The proposed right-of-way for the proposed Susitna hydroelectric project runs through the Fish Creek area from north to south (see Master Plan Map). The Alaska Power Authority proposes that the width of the right-of-way, located primarily in wetlands, be 400 feet. This line will not be built unless the Susitna dam is built. If the line is built as proposed, three tracts will be affected: tracts 37, 40, and 44.

Fish and Wildlife

Resource Description: Fish

Streams. Fish Creek and its tribularies are used for spawning, rearing, and as a migration corridor for rainbow trout and silver, red, and pink salmon during various phases of their life cycles. Although little is known about the other two tributaries of Flathorn Lake, Homestead Creek and an unnamed tributary, it is presumed that silver salmon juveniles and rainbow trout are present. Angler use occurs only in the lower three miles of Fish Creek and is very light, with most of the use coming from Flathorn Lake residents.

Lakes. Cow, Delyndia, Butterfly, Redshirt and Flathorn lakes comprise the major lakes within the Fish Creek planning area. Rainbow trout and juvenile silver salmon are found in all lakes. Additionally burbot, whitefish, and a few northern pike inhabit Cow and Redshirt lakes. Smaller lakes within the unit that have connecting inlets or outlets to major drainages contain juvenile silver salmon that utilize these waters as rearing areas. Red, silver, and pink, salmon migrate through Flathorn Lake and up Fish Creek and its tributaries to their termination at Redshirt Lake. Presently, all lakes within the unit receive recreational angler usage.

Adjacent land: Little Susitna River corridor. Rainbow trout, whitefish, Dolly Varden, and a relatively small number of Arctic grayling are present in the system. All five species of salmon are found in the Little Susitna River. In recent years angler use has rapidly expanded on the Little Susitna River, which is now one of the largest sport fisheries in upper Cook Inlet.

Adjacent land. Nancy Lake recreation area: The majority of the lakes in this area are part of the Fish Creek drainage. Several are stocked with rainbow trout and silver salmon. Most contain rainbow trout and juvenile silver salmon. Whitefish, northern pike, lake trout, and burbot are also found in some of the lakes. Angler use is fairly stable in this area, and only slight increases are expected on a yearly basis. If additional access is provided to this area (e.g. a road to Redshirt Lake) fishing pressure would increase.

Resource Evaluation: Fish

The Fish Creek system has good recreational fishing potential when access is developed. Between 2000 and 5000 adult red salmon migrate to Redshirt Lake, producing several hundred thousand red salmon rearing smolt. More than 2000 adult silvers spawn throughout the system. In addition, rainbow trout, grayling, and pink salmon are found in the system, but no information is available on how many.

Streams. Spawning and rearing habitat in all streams within the unit are considered to be critical in maintaining all resident and anadromous fish species. Spawning fish are dependent on silt free spawning gravels, while rearing fish are dependent upon stream bank vegetation for cover, protection from predators, food supply, and moderation of water temperature extremes. Maintenance of undisturbed stream banks along all tributaries is critical to fish habitat.

Enhancement could focus on selective removal of beaver dams and other natural obstructions that presently inhibit migration to spawning and rearing areas by anadromous and resident fish species.

Recreational use of the stream corridors is entirely dependent on access. It is expected that most fishing for anadromous species would take place in the lower three miles of the Fish Creek and Homestead Creek drainages. Increased fishing for resident species would occur in other areas within this drainage where and when road access becomes available.

Lakes. Juvenile as well as adult rainbow trout feed along the shoreline, since the most abundant food organisms are found there. There is little potential for enhancement of resident fish species in lakes with outlets or inlet streams. Continuation of resident species is primarily dependent on the spawning success of adults in connecting streams. Certain landlocked lakes within the unit may be enhanced by stocking them with rainbow trout or silver salmon.

Increased public use of resident lake fish species is totally dependent upon public access to the area. With improved public access it is expected that these lakes would provide substantial angling opportunities.

All lakes in the unit that have connecting inlets or outlets through either the Fish Creek or Little Susitna drainages are used by juvenile silver salmon as rearing areas. This use in some of the lakes is dependent on the fluctuations in water levels and stream blockages caused by beaver dams or debris. Stream flows into and out of these lakes may become intermittent and preclude migration of silver salmon, thus creating a temporary lake fishery for landlocked silvers. As with rainbow trout, juvenile and silver salmon use the shallow shoreline areas of the lake, so that it is important those shoreline areas are not disturbed but remain in their natural condition.

The enhancement potential for silver salmon populations using the lakes within the unit is good. Enhancement could be accomplished by additional stocking of silver salmon fingerlings or in some instances by clearance of stream blockages to allow existing silver populations to use the lateral tributaries, lakes, and marshes.

Angling for adult anadromous fish within the lakes in the planning area may be prohibited since these waters will be used as spawning areas for red salmon. Returning adult salmon that will benefit from lake stocking or stream clearings will be available to anglers only on streams within the unit.

Adjacent lands. The Little Susitna River is scheduled for enchancement of silver, red, and king salmon and is at the top of the priority list of enhancement projects in Cook Inlet for the Department of Fish and Game. Studies have been ongoing, and the stocking of red salmon fingerlings has already begun. The Little Susitna River is expected to become one of the highest public use areas in Cook Inlet in the near future.

Resource Description: Wildlife

Wildlife and their preferred habitats within the Fish Creek unit are similar to those in the rest of southcentral Alaska.

Wetlands. The lakes, streams, and wetlands of the area are especially important habitat for a wide range of wildlife. In the summer, moose feed on underwater vegetation along the margins of lakes, and in the winter they and other large animals such as wolves use the frozen waterways and upland buffers as open corridors; moose often congregate in the riparaian zone and other areas where preferred birch and willow browse occurs. Waterfowl use the area principally in the spring and fall in the course of their migrations, and bears are attracted to spawning salmon waters, moose calving areas, and the spring grasses and sedges in wetland areas.

In the spring, summer, and fall moose frequent the area's wetlands for feeding on the abundant willow, birch, aquatic vegetation, and grasses and for calving, particularly in the islands of spruce and birch scattered throughout. Waterfowl, too, feed and nest in the wetlands. Upland birds, such as willow ptarmigan, are often found in large willowed areas and spruce grouse are commonly found in mature stands of spruce. Mink, ermine otter, beaver, and muskrat are also found in the wetlands.

Upland areas. Although moose and bear occur throughout the area, the primary use of this area by game is for spring, summer, and fall habitat. In the spring bears frequent the sedge meadows but will use the uplands for denning and hibernation. The uplands of the Moraine Ridge unit contain greater densities of moose and bear. Wolverine, wolves, coyote, fox and possibly lynx also inhabit the uplands.

Adjacent land. It is estimated that at least a quarter million ducks, geese, swans, and cranes congregate in the Susitna Flats State Game Refuge during the spring and fall migrations. Additionally, upwards of 250 moose are seen in the area. In the spring, however, the number is considerably increased as females use the refuge for calving grounds from the end of May to the end of June.

The Little Susitna River corridor is extremely important to the moose migration as summer and winter range. River edges provide ample browse for moose. Black bear also frequent the area.

In the Susitna corridor the heaviest occurrence of moose is during the winter. The Susitna River serves as one of the most important moose winter habitats and corridors for moose migrating to and from the Beluga, Susitna, and Talkeetna Mountains.

Resource Evaluation: Wildlife

The most numerous big game species in the area is moose, with black bear second. When access is improved, hunting pressures on those species will increase. Habitat for moose is good along the stream edges and around the wetlands. Removal of mature timber will increase moose habitat and population considerably because of the regeneration of new feed sources.

As a result of the Willow Sub-basin Plan's designation of the Fish Creek unit as agriculture, no big game enhancement projects are recommended. As higher densities of moose already occur in the Moraine Ridge area, habitat enhancement may be needed if forage production and population levels are to be maintained. This will be considered in the preparation of the Moraine Ridge general development plan.

Because small game species rely on existing vegetation types found in Fish Creek, they will decline in the area as land clearing for agricultural purposes progresses. Small game enhancement projects could introduce upland game such as sharp tailed and ruffed grouse if access can be provided for on agricultural lands.

Those furbearers that utilize riparian habitat (mink, ermine, otter, beaver, and muskrat) will be comparatively unaffected by agricultural development because of the publicly owned stream corridors and wetlands. Upland species of furbearers (wolverine, wolf, lynx and to a lesser extent coyote and fox) will be displaced by the development. Trapping of some species will be affected by increased development.

At present, habitat for waterfowl is available in the refuge; however, agricultural crops such as grains could lead to a substantial shift in distribution, increase in waterfowl use, and a consequent increase in crop depredation.

Recreation

Resource Description

The Fish Creek unit has considerable recreation potential once access is developed. The unit has fishing streams, a number of lakes, and the Iditarod trail. Adjacent lands are already used for recreation, and this use will increase once roads are constructed. The Nancy Lake Recreation Area, to the north, offers canoeing in its lake system as well as hunting fishing, hiking, snowmachining, cross country skiing on maintained trails, and public use cabins. The Little Susitna River, to the east, is a good fishing stream which is already receiving heavy use. It is also a good canoeing river which will become very popular when there is a good road to its lower stretches southeast of the Fish Creek unit. People also hunt along the river. The Susitna Flats Game Refuge to the south is used primarily for waterfowl and moose hunting as well as for snowmachining and cross-country skiing. Road access to the Fish Creek unit will also mean access to the Susitna River, just west of Fish Creek, either through Flathorn Lake or by a two mile extension of the road system. This will be a popular "put-in" point for boaters using the Susitna River and also Alexander Creek, the Yenta River, and Kroto Creek. There is also good hunting, primarily for moose, in the Susitna Corridor.

Iditarod Trail. Currently the Iditarod "race trail" follows a seismic line that cuts diagonally through the southwest portion of the Fish Creek unit just north of Flathorn Lake. This seismic line is used as the race trail for two reasons: 1) this route is completely cleared and offers a direct run from the Little Susitna River to Susitna Station and 2) prior to this plan, the actual historic route had not been located. Additional use of the Iditarod "race trail" is primarily recreational (i.e., ATV, snowmachine, and cross-country skiing).

Prior to the Fish Creek Management Plan there had been no real need for identification of the historic route through this area. However, due to the planned sale of a majority of lands within Fish Creek, the historic route was located by Joe Redington, Sr., in conjunction with the Division of Parks and the Division of Land and Water Management. The historic route begins in the southeast portion of the area and runs generally at a northwest diagonal to Susitna Station, intersecting Fish Creek and several tributaries and traversing major wetlands.

The historic Iditarod Trail includes within its corridor a cabin site referred to as "Burns' cabin," a deteriorating log cabin adjacent to a small man-made clearing.

Other trails. Seismic lines crisscross the entire project area, including one on the township line known as "the connecting trail". The main obstacles to using these seismic lines are the abrupt stream cuts along major creek drainages, but they provide year-round access by snowmachine and ATV. In addition, a tractor trail runs through the southern portion of the project area from the Little Susitna River to its termination at Flathorn Lake. The trail is usable in the winter by snowmachine and by ATV in the summer months, depending on the depth of streams. However, old fill used to provide access across streams has washed out. limiting access. Present use of these trails is mainly recreational.

Three other existing trails identified in the Willow Sub-Basin Plan are 1) Susitna Flats Trail, located in the Flathorn Lake vicinity; 2) Yohn Lake to Susitna River Trail, which runs north/south along the base of Moraine Ridge; and 3) the Nancy Lake Loop Trail, which branches off the Yohn Lake to Susitna River Trail in the northern portion of the project. Present use of these trails is minimal, as indicated by reconnaisance of the area during winter months. Summer use of the Yohn Lake to Susitna River Trail is minimal due to the fact that most of it traverses wetlands.

Fish Creek and other streams. Fish Creek and Homestead Creek are the two main drainages running diagonally from northeast to southwest through the project area into Flathorn Lake. These two major streams are in turn fed by the wetlands scattered throughout the project area. The streams have formed cuts to 50 feet in depth, with widths to several hundred feet. The streams vary in width from 900 feet (Fish Creek) and 650 feet (Homestead Creek) at their confluence with Flathorn Lake to two feet in the upper reaches; the width averages between three and ten feet except in the lower stretches of Fish and Homestead Creeks and in areas of beaver activity. Because the streams meander and contain numerous windfalls and sweepers, ice-free navigability is poor. Winter use of this stream network is limited due to dense alder growth though some use by snowmachines does occur. Other summer and fall activities such as fishing and hunting may occur but are unlikely at present because of the inaccessibility of the area.

Flathorn Lake. Located in the southwest portion of the project, Flathorn Lake provides good air access into the area. The lake is approximately six square miles, glacial silt in nature, and relatively shallow. It was formed as an oxbow of the Big Susitna River, which in heavy spring flooding, overflows its banks into Flathorn Lake. Numerous trade and manufacturing sites and homesteads are situated along the east side of the lake, where the higher bluffs are located. Fishing is poor in the lake itself; the lake does serve, however, as a congregation point for salmon spawning in the upper reaches of Fish Creek, Homestead Creek, and their tributaries, provides duck hunting in the fall, and also functions as a kickoff point for moose hunters. The lake is fed by Fish Creek, Homestead Creek, and an unnamed creek and drained by Fish Creek into the Big Susitna River. The lower reaches of Fish Creek are usually passable by boat and provide access from the Susitna River to Flathorn Lake. Views from Flathorn Lake encompass Mount Susitna to the west and the Alaska range to the north. Because the west side of the lake is periodically flooded by the Susitna River, only the east side has potential for development. The only uplands in public ownership at this

time are along the southeast portion of the lakeshore, in addition to an existing and a proposed public recreation site at the northern tip of the lake.

Redshirt Lake. Located in the northeastern tip of the project area, this lake totals approximately six square miles. It lies north/south, half in the Nancy Lake State Recreation area and half in the Fish Creek Management unit. The lake is entirely surrounded by private ownership. Its non-glacial, deep waters offer good fishing for resident pike and burbot, and provide a spawning area for anadromous fish.

Cow Lake. Located three-fourths of a mile south of Redshirt Lake, Cow Lake is approximately one square mile in size and is non-glacial. Ownership around the southern two-thirds of the lake is largely native, with the exception of one state-owned ten acre site classified public recreation on the southeast side. The main recreational use is sport fishing.

Delyndia Lake. Located in the northeastern portion of the study area, this lake is nearly one square mile in size, is non-glacial, and consists of two bays, the east and west bays. Land ownership around the lake is entirely private, with the exception of a public recreation site of approximately ten acres at the southern end. Sport fish species are burbot and rainbow trout.

Hock Lake. Located on the eastern side of the project area within Moraine Ridge, this lake is approximately one-half square mile in size. Land ownership around the lake is private except for one state-owned ten acre parcel on the east side of the lake that is classified Public Recreation. Hock Lake drains into the Little Susitna River via a small outlet at its southeastern end.

Historical/cultural resources. The Division of Parks has identified one archeological site located south of Redshirt Lake. This site is reported to have been an old Indian fish camp and village.

The "Burns' cabin" site is discussed under the Iditarod Trail.

The only other known structures in the project area are the remnants of an old homesteader's cabin and small smokehouse located along Fish Creek.

Resource Evaluation

The Iditarod Trail. The Iditarod race trail along the seismic line offers a cleared, direct route with adequate crossings along stream cutbanks. The historic Iditarod Trail route has only recently been located. A centerline survey has been completed. The condition of the historic trail for travel purposes is relatively poor at present, with windfalls being major obstacles in the narrow ten-to-twenty foot cleared corridor. This segment of the historic trail had been cleared in the 1940's. The use of the trail at present is minimal to none. The Iditarod Trailblazers have begun clearing the historic trail and hope to complete the clearing prior to the 1985 Iditarod Trail Dogsled Race.

The Willow Sub-Basin Plan determined that those portions of the Iditarod Trail in state and borough ownership will be protected by a public ownership corridor. The intent is to reserve and manage one trail through the study area. That is the historic trail, located and surveyed in 1983. Options defined for the corridor width were either 600 feet or less. The Willow Sub-Basin Plan allows a reduction in width only after consultation with the Division of Parks and the Matanuska-Susitna Borough trails committee.

Possibilities for sites that would remain in public ownership for access and use of the trail would be 1) at the junction of the primary road and the Iditarod Trail and 2) at trail and major stream intersections. The former (1) would insure pull-off areas for viewing of the race; the latter (2) would be oriented more towards camping in conjunction with use of the trail and/or Fish Creek and its tributaries.

Burns cabin. There are several management options for the Burns cabin: (1) stabilization; (2) reconstruction with adaptive reuse; (3) restoration; (4) reservation of the site and management for recreation or historic preservation (but no work on the cabin). The site has been designated a "level three" minimum management site by the Joint State-Federal Iditarod Trail Study. When compared with nearly 500 other historical sites along the Iditarod Trail System, the Burns' cabin site was not recommended for special management such as restoration, stabilization or development as an interpretative site.

Trails. Two land management options exist for seismic lines, tractor trails, and recreational trails. These are 1) public retention of these trails or 2) elimination of these trails in areas where adequate alternate access is provided by the Fish Creek road system. Retention would ensure that the trails are preserved in their present state but would result in an irregular land pattern. Integration of these trails into the proposed road system would provide for a more organized land pattern but may change the use opportunities these trails now provide.

Fish Creek and other streams. All streams within the project area have the potential for year-round recreational use. During periods of ice-free conditions, these corridors could be used for fishing, hiking, and camping. The lower three miles of Fish Creek is wide, lakelike, and extremely attractive. It could be used for canoeing and boating generally. Once the area has access, heavy use of the streams for fishing can be expected. During the fall, these drainages could offer hunting opportunities for waterfowl and moose. Winter use could include snowmachining, cross-country skiing, and camping.

Recreation sites at stream/primary road intersections. Projected uses at these sites are for parking on a day, overnight, or long-term basis to provide access for fishing, hunting, and other recreational uses.

Flathorn Lake. If the Fish Creek Unit's agricultural potential is realized, the likelihood of grain crops would very probably attract additional waterfowl into the area. Conceivably, the birds would use the Susitna Flats State Game Refuge during the day and feed in the fields in late afternoon and evening, a portion of them very likely using Flathorn Lake.

As both access and the agricultural area are developed, there will be an increasing demand on the fishing resources of the unit and that will eventually require the provision of facilities for both day and overnight use. Because of the seasonal flooding of Flathorn Lake and existing private ownership, feasible locations for public recreation sites exist only at its north and south ends. Of the existing state-owned public recreation site at the north end, only about five acres is useable. An adjacent site on borough land along the shoreline could be retained in public ownership, thus in effect expanding the site.

The potential recreation site at the south end of the lake includes more water frontage than does the site at the north end. In addition, deposits from Fish Creek have formed a small point of land at this location that could be used for launching boats. The site would likely prove inviting to hunters and fishermen and to people who would enjoy an unobstructed view of Mount Susitna to the west and Denali to the north. A public boat launch facility would provide access to the Susitna Flats State Game Refuge for waterfowl and big game hunting as well as hunting, fishing and trapping along the Big Susitna River.

Other lakes. Other lakes in the project area are almost completely surrounded by private ownership, with the exception of a ten acre site on Cow Lake, a ten acre site on Delyndia Lake, and a ten acre site on Hock Lake. These sites are classified as Public Recreation Lands. These sites could be used to provide various camping opportunities. Options would be 1) to develop access and camping facilities, or 2) to leave the parcels roadless and in their natural condition as undeveloped camp grounds.

Historical/cultural resources. Land management options for the historic village site south of Redshirt Lake range from its recognition and retention in public ownership to its integration into the total development of the area. Obviously, the most preferable option would be the retention of this site; however, at this point the extent of its historical significance has not been fully documented.

Materials

The Fish Creek area appears to have excellent gravel resources throughout it. In the northeast and eastern portion of the study area there are pitted outwash deposits (unit Qpo) which should be a good gravel source. The north-south primary road corridor lies almost entirely on these deposits. In the central, southwestern and northwestern portions of the study area there are numerous old outwash deposits (unit Qoo) which are also good potential gravel sources. The alternate north-south primary corridor traverses these. There will be considerable variation in the suitability of the sand and gravel in these units for construction purposes. There is also a potential problem with water in the quarry sites. In addition to the Qpo and Qoo units, there may be local, isolated sand and gravel in other units. However, the Qpo and Qoo units offer the best potential. (The units refer to a surficial geology map on file at the Southcentral District Office of DNR.)

Subsurface Resources

The Fish Creek subunit is overlain by glacial till, and alluvial and colluvial deposits. No occurences of hardrock minerals or coal are known to exist within this subunit. The area is thought to be underlain by undifferentiated rocks of Cretaceous age and sedimentary units of Teritary age. These Teritary age rocks may be of the Kenai Group, which hosts coal deposits throughout the Beluga-Susitna lowlands. The coal potential for this area is considered low because of the unknown geology, glacial cover, and the availability of coal resources already identified.

The Fish Creek area is part of the Cook Inlet Basin and was included within the boundaries of the State of Alaska Oil and Gas Sale 40 held in September, 1983. The portion of Township 16 North, Range 7 West, Seward Meridian that is within the study area was included in a lease that was purchased at this sale. The area is considered to have low to moderate potential for petroleum.

Legend

- Planning Area Boundary
- Ownership Boundary
- Private Lands
- Management Unit Boundary
- Iditarod Historic Trail

- Swamp Deposit
- Channel Deposit
- Outwash Deposit
- Moraine
- Known Fault
- Probable Fault

Susitna Corridor Management Unit

Nancy Lake State Recreation Area

Borough

T18N

T17N

State

Homestead Creek

Fish Creek Management Unit

Castle Mountain Fault

Moraine Ridge Management Unit

State

Hock Lake

Little Susitna Corridor Management Unit

T17N

T16N

Borough

Castle Mountain Fault

State

R7W | R6W

Flathorn Lake

R6W | R5W

Susitna Flats State Game Refuge

North

0 1 mi.

FISH CREEK
Management Plan

Surface Geology

Chapter 3
Management Plan

The Fish Creek subunit is to be developed as a major, commercial agricultural project and the Moraine Ridge subunit as a settlement area, with a mix of year-round residences and recreational cabins and a commercial center at the southern end of the Ridge. Provision has been made for transportation corridors through and within the unit. Important public recreation, fish and wildlife, and water quality values will be protected by retention in public ownership of an inter-connecting system of wetlands and stream corridors. A 400 foot-wide corridor for the Iditarod trail will also be retained in public ownership as will key access points to Fish Creek and the lakes in the unit. The selected Master Plan for the study area is depicted on page 47.

It is likely that the Fish Creek study area will eventually be traversed by a major north-south road connecting the Point Mackenzie area with the Parks Highway near Willow and a major east-west road connecting the Beluga area with the railbelt. The Master Plan shows the preferred alignment for these corridors. These locations were selected over other alternatives because they allow the optimum farm tract layout. The corridors were located by Department of Transportation utilizing available information, primarily a soil survey by the Soil Conservation Service. A preliminary engineering study which will provide more detailed information is necessary before the location of those corridors can be considered final. Some minor adjustments in the farm tract layout may be necessary if the preliminary engineering study determines that the corridors need to be relocated.

In addition, if the preliminary engineering study indicates that the north-south road, as shown on the Master Plan, will be substantially more expensive to build then the estimates in this plan, then the cost of building a road in the alternate north-south corridor shown in the Appendix should also be determined. If it is determined that it would cost substantially less to build the main north-south road in the alternate corridor, DNR, DOTPF, and the Matanuska-Susitna Borough should reevaluate the two alternatives. A substantial change in the Master Plan (e.g. moving the main north-south road west into the alternate corridor) would require an amendment of this plan. This issue is discussed further under Transportation in this chapter.

Specific management decisions are described in the following pages; they are organized by the resource they most affect.

Agriculture

Management Intent

The overall management objectives for agricultural development in Fish Creek may be summarized as follows:

*To increase the statewide agricultural land base, thereby expanding agricultural production and broadening the state's economic base.
*To provide opportunity for development of a diversity of farms.
*To encourage production of crops complementary to market development.
*To protect the area's soil resources.
*To manage agricultural development so that the spawning habitat of the streams and lakes is not diminished, to minimize negative impact on other resource values in the unit, and to increase opportunities for recreational uses.
*To increase employment opportunities.

Classification

With certain limited exceptions, borough ordinance 13.28.050 requires that areas of 40 acres or larger with more than 40% of Soil Conservation Service capability classes II and III be classified prior to disposal as agricultural unless other conditions exist which require the use of the land for other purposes. State regulations provide for classifying suitable lands as Agricultural land. The Master Plan Map on page 47 shows the agricultural tracts that will be classified as Agricultural Land as part of this plan. Most Class II and III soils are included in the areas to be classified as Agricultural Land. Should further field investigation discover locations that do not meet the criteria of borough ordinance 13.28.050, other uses may be considered at that time. Actual classification of borough lands will not occur until further field work verifies the existence of Class II and III soils in the areas proposed to be classified as Agricultural.

Planned Actions

The Fish Creek agricultural project is planned and will be implemented jointly by the borough and the state. Ideally, development will proceed generally in the following sequence:

1. Adoption of the joint state/borough management plan.
2. Completion of baseline studies.
3. Development of access.
4. Enactment of a joint state/borough land sale.
5. Land clearing and timber salvage.
6. Development of utilities and support facilities (utilities could be developed sooner).

Legend

- Planning Area Boundary
- Private Land
- Intensive Settlement
- Non-intensive Settlement
- Agricultural Tract
- Public Recreation
- Public Retention
- Primary Road
- Secondary Road
- Trail

Susitna Corridor Management Unit

Nancy Lake State Recreation Area

MR1

MR2

MR3

T 18N

T 17N

Homestead Creek

Moraine Ridge Management Unit

Iditarod Historic Trail

Burn's Cabin

Hock Lake

T 17N

T 16N

Little Susitna Corridor Management Unit

R 7W R 6W

Flathorn Lake

Alternate Route

R 6W R 5W

Susitna Flats State Game Refuge

Susitna Hydroelectric Transmission Line—Proposed

North

0 1 mi.

FISH CREEK
Management Plan

Master Plan

Fish Creek's project status. Previous large agricultural sales have been treated as projects by the legislature. Funds for all development costs have been appropriated in a lump sum to the Alaska Agricultural Action Council (AAAC) who coordinated the agricultural projects. The AAAC terminated July 1, 1984. To increase the chances of successful agricultural development at Fish Creek, it is important that it be developed as a project, with funds for all development costs appropriated at one time. If this is done, the Department of Natural Resources will most likely assume the coordinating role.

If Fish Creek is assigned project status, requested funding would come from the legislature for access construction, land surveys, and project administration. Funding for access and clearing loans is very critical to the success of the Fish Creek project. The value of the timber, if salvaged, is unlikely to cover the costs of either road construction or land clearing. Both access and clearing are expensive. A preliminary cost estimate for a first generation gravel road system indicates it will cost a little over $17 million (for access from the south and phase 1 roads; see Road Phases Map, page 77). The clearing cost, estimated at $300 an acre, would come to $4.8 million for the 16,000 acres.

Agricultural land sale. Land ownership of the agricultural lands is divided between the state (40%) and the borough (60%). Borough ordinances limit the size of agricultural disposals to 640 acres per tract. Family farms producing for local market and consumption are regarded as most appropriate for the area, given its location. Other factors contributing to the diversity of farm sizes are:

*the stream and wetland areas;
*the projected primary transportation corridors;
*the historic Iditarod Trail corridor;
*the discontinuity of Class II and III soils;
*consideration of parcel shape (length and width);
*consideration of the land survey cost; and
*the ownership boundaries.

The borough and state will conduct land sales conveying 55 farm tracts into private ownership. The tracts will range in size from 40 to 700 acres, though no borough tract will exceed 640 acres. There are 14 state-owned tracts, 35 borough-owned tracts, and 6 state-borough tracts. A chart at the end of this chapter gives the soil class breakdown for each tract. The borough and state sales may be held separately if the state and borough terms are different. (see Chapter Four).

Land sale methods will be decided upon at the time of the sale; at present, state sales are by lottery and borough sales by auction. The borough currently sells leases with an option to purchase. The state may consider a similar system.

The exact timing of the sale will depend on availability of funding for access roads and surveying. Alaska statute 38.05.321 limits the sale of state land classified as agricultural to the transfer of agricultural rights only.

Borough ordinances (provisions of Title 13.28) provide for similar restrictions which are designed to discourage subdivision of agricultural soils into residential lots and to encourage the use of agricultural soils for farming.

The sale price for both state and borough parcels will include the value of the marketable, commercial timber on the parcel. See Forestry guideline #1, page 56. The minimum price for borough land will be established by the borough, based on the appraisal modified by the agricultural use restriction. The borough land will then be offered at auction. The final price will be determined by the bidders.

Use of timber resources. The farm tracts, together with their timber resources, will be sold to the successful applicant/bidder, who could then occupy the land immediately. Farmers will be encouraged to salvage the timber. See the Forestry section for details.

Land survey. A combination of meander and aliquot part surveys will be used in surveying the farm tracts in order to keep survey costs as low as possible while meeting two objectives: 1) keeping as much of the wetlands as possible in public ownership as required by the guidelines in the Willow Sub-Basin Plan, pages 100-101; and 2) delineating clearly between public and private lands.

Farmsteads. All farm parcels will include a farmstead area in which homes, barns, storage buildings, and other facilities usual for agricultural operation are sited. Provisions of 11 AAC 67.187 restrict farmstead sites on state lands to five acres unless the director of the Division of Agriculture determines that a larger area is necessary. Borough tracts will also include farmsteads of up to five acres. Woodlots are not included in the farmstead areas but may be identified in the farm conservation or development plans.

Windbreaks. Windbreaks are probably needed in the Fish Creek region because of the known wind conditions in the nearby Matanuska Valley, which are capable of eroding disturbed Class II and III soils, especially during the developmental period of the project. Rapid transitions can occur from the present large areas of native, near-climax vegetation to bare mineral soils, which are characteristically fragile.

Exact characteristics of local wind conditions are unknown at this time; a predominantly north-south wind pattern is suspected. The requirement for windbreaks is therefore a preventive measure. The study on wind direction and velocity called for in the guidelines may provide new information which may change the requirements for windbreaks.

Wetland buffers, stream buffers, and the historic Iditarod Trail buffer will all provide permanent windbreaks that in some areas may reduce the need to reserve additional windbreaks.

Mineral entry closure. Since the area's mineral resources are not considered to have economic value and since agriculture and hard rock or open pit coal mining are incompatible, the entire Fish Creek plan area will be closed to mineral entry and coal prospecting and leasing. (This does not apply to sand and gravel; see Materials section, page 86.) Since oil and gas operations are more compatible with agriculture, the area will be left open for oil and gas exploration and leasing.

Management Guidelines

1. Windbreaks will be required. Their location must be shown on the farm conservation plan. These windbreaks will be rows of natural vegetation a minimum of 30 feet wide. Where the existing vegetation is overmature and sparse, wider windbreaks are encouraged. The Division of Agriculture, SCS, or the Matanuska-Susitna Borough may require wider windbreaks and planting of additional trees where necessary prior to approving the farm conservation plan. Windbreaks will be at 660 foot intervals and will run from east to west unless the Division of Agriculture, SCS, or the Matanuska-Susitna Borough requires or approves a different interval or a different orientation based on information about wind direction at the particular farm. Selective timber harvest within windbreaks is permissible for either commercial or personal use (in order to allow selective timber harvesting prior to identification of windbreaks). Clearcutting within windbreaks is prohibited. If timber is to be harvested by clearcutting, windbreaks must be identified first. Pass-throughs up to 30 feet wide will be allowed, taking advantage of natural breaks in the vegetation to allow for equipment travel. Pass-throughs should be specified in the farm conservation plans. If further information shows that windbreaks are not necessary in the judgment of the Division of Agriculture or the Matanuska-Susitna Borough, farm conservation plans may be amended to allow clearing and cultivation of the windbreaks.

2. Farm Development Schedules will be required for all farms within the Fish Creek Unit. Farm Development Schedules will be determined by Divisions of Land and Water Management and Agriculture and the Matanuska-Susitna Borough after a more precise timetable is known for the proposed land sale. They will specify how much acreage must be cleared and cultivated each year and a timetable for clearing and cultivation. They will be made part of the sales contract.

3. Farming of publicly-owned right-of-way corridors. Following establishment of the transportation corridors and the construction of pioneer roads, the remainder of the road corridor not part of the actual roadway may be leased to private individuals for agricultural use subject to easements. This also applies to phase 2 and 3 roads prior to road construction. No permanent improvements will be allowed in the corridor. Temporary structures or agricultural improvements may occur on leased corridor lands at the risk of the lessee. Those leasing corridor lands will not be compensated for improvements placed on or activities conducted within the leased lands, should use of the corridor be required for transportation purposes (including utility lines). Such agricultural use may not preclude the use of these areas for hunting and access. Windbreaks may not be removed to obtain access to the right-of-way.

4. Farm conservation plans will be required for all farms within the Fish Creek unit. On state lands farm conservation plans will be approved by the Director, Division of Agriculture and the Soil Conservation Service sub-district in consultation with the Department of Fish and Game. On borough land Farm Development Plans will be approved by the Borough Assembly based on the recommendations of the Borough Agricultural Advisory Board, the Soil Conservation Service sub-district, and the Department of Fish and Game. Farm conservation and development plans will incorporate soil, water, and wildlife conservation practices as developed by the SCS and other affected agencies. ADF&G's technical assistance to farmers and soil conservation subdistricts in the preparation of farm conservation plans will be the primary means of incorporating fish and wildlife concerns into these plans. In addition they will include:

   - location of ground to be cleared and broken
   - access development
   - farmstead location
   - utilities development
   - windbreaks and pass-throughs
   - woodlots
   - material borrow and use areas
   - crossings of the Iditarod trail where applicable
   - buffers along wetlands or streams (see guideline 8 below and guideline 10 in section on Wetlands and Stream Corridors, page 62.)
   - location and type of crossing of any streams located within farm tracts or between two tracts sold to one person (see guideline 15 in section on Wetlands and Stream Corridors, page 63.)
   - timber sale or timber harvest plans (see Forestry guideline 2, page 56)

5. Use of surface water from wetland areas. (Refer to Wetlands section, (guideline 11, page 63.)

6. In borough tracts 1, 2, and 17, there will be a 200 foot publicly-owned buffer between ordinary high water on Flathorn Lake and agricultural tracts. The purpose of the buffer is to provide for public access along the lake and to protect water quality.

7. Tracts 7, 11, 22, 25, 31, and 37 contain both state and borough land. A cooperative agreement will be developed between the Matanuska-Susitna Borough and the Division of Land and Water Management prior to the land sale to allow these tracts to be sold as shown on the Master Plan. The borough will quit-claim the borough land in these tracts to the state in exchange for the revenues received from the sale of land originally owned by the borough. The state will sell the tracts and the sale will be subject to state terms. The borough portion of any combined tract may not exceed 640 acres. In lieu of this, a land exchange between the borough and state may be arranged so that each tract belongs to either the state or the borough; or the borough may select the state land in these tracts.

8. In tracts 6 and 23 there will be a 100 foot buffer on either side of the stream within these tracts in order to protect water quality. This land will be conveyed to private ownership as part of the tract and is to be

maintained in natural state. Where necessary to protect water quality, the farm conservation plan will require buffers wider than 100 feet on a case-by-case basis. This guideline applies to all tracts that have streams within them. Others may be discovered during tract survey.

9. See Forestry section for guidelines on land clearing.

10. Access to important public resources (e.g. wetlands and streams) should be maintained or improved during land disposals. Section line easements will not be vacated unless appropriate substitute physical and legal access exists. However, the location of realistic substitute access is encouraged. The substitution should be through publicly-owned trail corridors, but in some cases could be through a trail easement if significant use is not expected to occur. Determination of the adequacy of substitute access will be made by the Division of Land and Water Management in consultation with the Division of Parks and Department of Fish and Game on land purchased from the state and by the Matanuska-Susitna Borough on land purchased from the borough.

11. Agricultural tracts that are adjacent to existing private land will include an easement 100 feet wide along the common boundary between the existing private land and agricultural tracts to allow for road access to the private lots. Prior to use as a roadway, road easements may be cultivated. However, if members of the public wish to use the easement for access, the farmer must allow them to do so. The use may be a narrow trail or the farmer may reroute the trail around his field.

12. Corridors for phase 2 and 3 roads: see Chapter Three, Transportation Section, guideline 12, page 75.

13. Baseline studies. Prior to agricultural development the following studies should be conducted:

    - a water quality evaluation to determine present water water quality plus monitoring following the onset of development to determine whether changes in water quality occur;

    - surface and ground water evaluations to determine the quantity of water available for agricultural needs;

    - an instream flow study to determine the quantity of water needed from the three major streams to meet the needs of fish and wildlife (with Fish Creek as first priority);

    - wildlife and bird population study to determine baseline population data for large unqulates, small mammals, and birds in the different vegetation types represented within the agricultural project area;

    - pesticide residue sampling to detect and measure any residues that may exist in the area prior to agricultural development.

    Property owners in the area should be made aware of these studies and their results. See the appendix for list of those who have expressed interest in this plan.

Table 1
FISH CREEK
AGRICULTURAL TRACT ACREAGES
(Approximate)*

TRACT #	CLII	CLIII	CLIV	CL II & III	Wetlands	Roughlands	TOTAL	% CLII, III SOILS IN TRACT
1	--	228	122	228	83	--	436	52%
2	--	256	37	256	12	5	314	81%
3	20	366	6	386	55	4	461	84%
4	611	2	7	613	12	25	656	93%
5	425	--	44	425	16	31	516	82%
6	616	8	22	624	154	41	845	74%
7	316	--	--	316	1	15	331	95%
8	68	--	--	68	--	1	69	99%
9	154	14	9	168	--	2	180	94%
10	150	25	28	175	29	7	240	73%
11	263	--	81	263	21	11	377	70%
12	504	--	--	504	--	9	514	98%
13	184	--	6	184	--	16	208	89%
14	116	--	--	116	--	2	118	98%
15	64	259	85	323	25	11	445	73%
16	--	276	32	276	12	1	324	85%
17	16	384	15	400	13	14	442	91%
18	483	--	--	483	3	42	529	91%
19	294	219	9	513	29	11	564	91%
20	324	42	--	366	--	4	370	99%
21	44	130	--	174	40	13	229	76%
22	256	177	101	433	160	32	747	58%
23	7	174	5	181	22	1	209	87%
24	9	187	57	195	37	3	295	66%
25	607	9	30	616	41	6	696	89%
26	181	--	--	181	17	--	199	91%
27	465	37	11	502	30	7	557	90%
28	156	--	--	156	4	2	164	95%
29	16	51	--	66	6	8	81	82%
30	211	215	163	426	93	19	703	61%
31	350	--	3	350	43	32	428	82%
32	484	11	25	495	72	23	631	78%
33	146	--	33	146	24	--	212	69%
34	400	--	--	400	19	9	428	93%
35	223	--	--	223	53	6	283	79%
36	230	--	30	230	82	--	345	67%
37	111	--	6	111	44	1	162	69%
38	70	--	--	70	3	--	73	96%
39	134	--	--	134	28	--	163	82%
40	67	--	67	67	29	--	163	41%
41	84	--	8	84	--	--	92	91%
42	81	69	--	150	41	8	203	74%
43	55	59	3	114	27	25	169	67%
44	330	64	41	394	69	26	530	74%
45	203	--	4	203	5	8	220	92%
46	104	--	36	104	44	3	187	56%
47	74	85	156	159	34	32	382	42%
48	--	206	87	206	36	71	400	52%
49	209	121	--	330	107	--	438	75%
50	58	71	16	129	9	4	158	81%
51	37	13	16	50	9	--	76	66%
52	94	--	31	94	15	--	140	67%
53	22	--	--	22	--	--	22	98%
54	168	--	11	168	16	13	208	81%
55	156	--	5	156	32	15	220	71%
56	27	92	50	119	26	8	211	57%
57	200	79	--	279	39	--	319	88%
58	201	11	25	212	41	--	286	74%
59	68	--	118	68	22	39	257	27%
MR1	--	74	--	74	30	--	105	71%
MR2	--	85	43	85	7	8	142	59%
MR3	--	118	--	118	--	7	125	94%
BOROUGH	6,785	3,864		10,649			13,536	
STATE	4,681	646		5,329			7,214	
TOTAL	11,466	4,510	1,739	15,978	2,110	886	20,750	

* Acreages are approximate because they are calculated from data represented at 1:63,360; precise acreages will not be available until the tracts are surveyed. Acreage included in secondary roads (100 ft. corridors) has not been subtracted out of tracts. Discrepancies between the total of the categories and the total acreage in the tracts is generally due to water and imprecision in the data.

Forestry

Management Intent

There are two primary management goals for the timber in the Fish Creek unit. One is to salvage and utilize the valuable timber as part of the development of the agricultural tracts. Secondly, forest stands in the publicly-owned wetland buffers, recreation corridors, and the Moraine Ridge subunit will be managed to support the primary uses designated for these areas (wetland protection; recreation; and residential, commercial, and industrial development, respectively). Timber in these areas may be available for limited cutting under guidelines listed below.

Classification

There will be no land classified as Forest Land. Forest management activities may occur on lands classified for other purposes, subject to the guidelines listed below.

Planned Actions

Two alternatives were considered for management of the timber resources on the agricultural lands: selling the timber prior to and separately from the agricultural rights sale; or selling the timber with the agricultural rights and encouraging the farmer to salvage the timber.

The second alternative is the selected alternative. This alternative was selected because it best meets the two objectives of utilizing both the agricultural and timber resources. Assuming that timber will be harvested and farm lands developed, the highest return from each will be realized. Unfortunately, it is not possible to obtain the maximum return from development of one of these resources without negatively affecting the other. Roads are essential for agricultural production. The economic analysis by the Division of Agriculture estimates that the potential return (present value of benefits less present value of on-farm costs) from agricultural development could be sufficient to offset the cost of road construction (present value of off-farm costs). Timber harvest also cannot take place without roads. The value (quality, volume, and price) of timber at Fish Creek is insufficient to cover costs associated with timber harvest as well as road construction. To further complicate the problem, the timber market is not strong enough to utilize the timber within a reasonable period of time following road construction (such as three to five years). Full utilization of the timber, given the present industry and market situation, would probably require a delay of ten years between road construction and sale of agricultural tracts.

Such a delay would significantly reduce the net present value to be gained from agriculture. Thus the entire project (both timber and agriculture) becomes less feasible. Looking at it another way, if the state invests $17 million to build roads in Fish Creek, ten years of delay in agricultural development results in ten years before significant return on the investment begins. Such a delay could be justified if the loss of return from agriculture were to be offset by return from timber. That does not appear to be the case. Therefore, if roads are constructed for both logging and farm use, investment costs will be offset primarily by the values generated by agriculture. Given this fact and the significant reduction in the net present value of agricultural benefits caused by a ten year delay, such a delay is not warranted.

At least part of the timber can, however, be harvested through sales by individual farmers under the guidelines in this plan (see Forestry guideline #2 below). The Division of Forestry estimates that nearly as much timber would be salvaged by farmers as could be harvested by state and borough timber sales if harvest were restricted to a three to five year period. The state and borough would also need to identify non-cutting areas such as farmsteads and windbreaks prior to timber sales. Generally farmers prefer to lay out farmsteads and windbreaks themselves. Since it is unlikely that public officials could satisfy farmers in the location of farmsteads and windbreaks, and since the value of timber sold by farmers is expected to nearly equal public sales restricted to a three to five year period, selling the timber with the land and providing an incentive to encourage farmers to salvage the timber is the best alternative.

Management Guidelines

Land sales/timber value.

1. The sale prices for the agricultural interests on both state and borough-owned parcels will be determined by the comparable sales method of appraisal. This method includes in the sales price the value of any marketable, commercial timber existing on a parcel.

2. Utilization of the timber is preferable to burning it. To encourage farmers to sell the timber, the following incentive is provided: upon approval of either a timber sale contract or a timber harvest plan (as part of the farm conservation plan), an extension of the farm development schedule will be provided for in the sales contract to allow time for timber harvest and a timber sale. The extension will be for a maximum of three years from the date of the land sale contract. A farmer may choose to harvest the timber himself for subsequent sale directly to consumers; in this case a timber harvest plan and schedule will be required. The timber sale contract or the timber harvest plan and schedule must be approved by the state area forester or the borough before the extension will be granted. The timber sale contract or harvest plan must contain performance requirements acceptable to the Divisions of Land and Water Management, Forestry and Agriculture or the borough to ensure that the delay in the farm development schedule is justified. Farmers intending to harvest the timber themselves must submit their timber harvest plan prior to or as part of their farm conservation plan. Farmers intending

to sell the timber must submit their timber sale contract prior to or as part of their farm conservation plan; however, they may also qualify for the extension if a timber sale contract is secured within six months of the execution of the land sale contract.

Farm clearing.

3. Farm clearing plans will be included in the farm conservation or development plan and must be approved by the Divisions of Agriculture and Forestry on state land and the Borough Assembly on borough land (see guidelines under Agriculture in this chapter).

Disposal of slash.

4. Burning will generally be allowed only when conditions are optimum for both low-fire hazard and low smoke production (generally fall or spring). Burning must be authorized in advance by the Division of Forestry (DOF) and the Department of Environmental Conservation (DEC). Burning permits are required year-round by DEC and during fire season (normally from May 1 through September 30) by DOF. During the remainder of the year authorizations may be obtained verbally from DOF.

5. Piling of slash should be done when the ground is frozen to a depth of at least 6 inches by a bulldozer equipped with a brush blade in order to minimize the soil content of piles. All slash (limbs, tops, stumps, trees, brush, roots, and logging debris) must be burned or removed from areas being cleared for agriculture to reduce fire hazard. ("Burned" does not necessarily mean total consumption of the slash pile. Enough of the slash pile must be consumed to eliminate fire hazard in the judgment of DOF.). Slash piles to be burned should be tightly stacked. The length of any one slash pile cannot exceed 600 feet, nor 75 feet in width. No slash pile shall be placed within 100 feet of another slash pile with the exception that a 25 foot break in the slash piles between 600 foot alignments is permissible. A 50 foot mineral soil firebreak shall be constructed and maintained around the area containing slash piles that are to be burned. If the burning is to be done during fire season (normally May 1 through September 30), three hundred foot firebreaks around the periphery of the area are required.

6. The Division of Forestry will have personnel in the field during piling of slash, if funding is available.

7. Slash piles closer than 300 feet to the periphery of the area may not be burned during the fire season (normally May 1 through September 30) unless the following conditions are met:

    a) Authorization must be obtained daily from the Anchorage/Matanuska-Susitna Area Forester (or his agent) after 11:00 a.m. and before ignition commences.

    b) The level of manpower and equipment specified by the Area Forester (or his agent) must be maintained during the burning operation between the times specified by the Area Forester (or his agent).

c) Perimeter slash piles must be burned in such a way that a 300 foot firebreak is burned out before the interior slash piles are burned in any area during the fire season (normally May 1 to September 30).

8. The burning requirements listed in this section may be amended by a Burning Permit issued by the Division of Forestry.

Woodlot management.

9. Farmers may designate a portion of their parcels as woodlots in the farm conservation plan (see guidelines under Agriculture in this chapter). Upon request, the Division of Forestry will assist the farmer in selecting the optimum location and size and in developing a management plan for the woodlot. Conservation measures for wildlife and water quality will be included in the plan.

Salvage timber sales.

10. On request, the Division of Forestry will advise farmers wishing to sell their timber. In addition, they will seek funding to provide assistance with timber sales including appraisal, sale layout, sale procedures, contract development, and timber sale administration.

11. The DNR offices in Wasilla and Big Lake, the Southcentral District Office of the Division of Land and Water Management in Anchorage, and the Matanuska-Susitna Borough will provide members of the public wishing to obtain firewood with information on how to contact the farmers who have firewood available. Farmers should be made aware of this at time of purchase.

12. Every attempt will be made to salvage valuable timber to be cleared from road rights-of-way. Following receipt of funding for road construction, state and borough foresters will evaluate the options for making the wood available to the commercial market and for personal use. The Division of Forestry and the Matanuska-Susitna Borough will conduct all timber sales within rights-of-way on their respective lands. If commercial volumes are not present, cutting for personal use will be allowed in order to utilize the trees and slash created in the clearing operation.

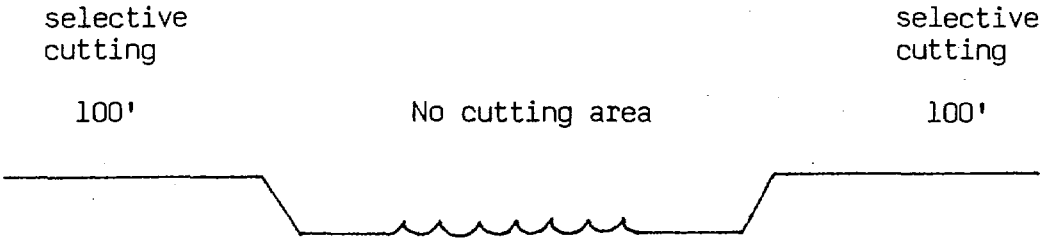
Restricted cutting areas.

13. Trails: timber harvest in the corridors for the Iditarod Trail and the Yohn Lake to Susitna and Nancy Lake Loop trails will be allowed only if such harvest protects or enhances the use or visual, sound, and other characteristics of the trail. Division of Parks must be consulted in making this decision on state lands.

14. Goose Bay/Chuitna River and Point MacKenzie/Willow transportation corridors: within each of these corridors (400 feet total width) only selective cutting of trees 12 inches d.b.h. or greater will be allowed except for the actual roadway and utility areas which will be totally cleared. Initial road clearing within these corridors is expected to be approximately 100 feet total width.

15. Wetland buffers:. only selective cutting will generally be allowed within 100 feet of Class I and II wetlands. This guideline may be changed for specific locations by the Division of Land and Water Management or the Matanuska-Susitna Borough following consultation with the Division of Forestry and the Department of Fish and Game.

16. Commercial timber harvest may be allowed in the buffer along Fish Creek and its tributaries and along other creeks if it is consistent with the purpose of the buffer and adequate justification exists. The Department of Fish and Game, the Division of Parks, and the Division of Forestry must approve of the harvest if on state lands and jointly establish stipulations. The streams in this area are often bordered by stream banks deeply cut into the otherwise relatively flat landscape. These flat areas immediately adjacent to the top side of the steep stream banks are very important habitat for wildlife. They are also important in the prevention of erosion of the canyon wall. Therefore, only selective cutting will be allowed in a 100-foot-wide strip back from the top of the stream banks. (Where the land at the top of the stream banks is to be included in an agricultural tract, the buffer will be 50 feet wide.) See illustration for restricted cutting along stream buffers.



17. Isolated "islands" within wetland areas: selective cutting for personal use only will be allowed; refer to pages 61-63 for further guidelines.

18. Moraine ridge: timber harvest in Moraine Ridge subunit will be limited to selective cutting for commercial or personal use where it is compatible with proposed or existing development.

19. Windbreaks: see Guideline 1, Agriculture, page 51.

20. Public Recreation sites: timber cutting in public recreation sites will be limited to dead and down trees.

Reevaluation of timber sale potential.

21. If the sale of agricultural rights has not occurred and is not scheduled within 5 years of the adoption of this plan, the feasibility of a timber sale prior to sale of agricultural rights may be reconsidered. Factors that could change the feasibility are increased demand and production capability of local loggers. If for any reason there is a lagtime of over a year between construction of initial access into the area and the sale of agricultural tracts, the Division of Forestry and the Matanuska-Susitna Borough should consider short term, small scale timber sales using selective harvest techniques. Clearcutting is prohibited unless all non-cutting areas, including windbreaks and farmsteads, are pre-identified.

Wetlands and Stream Corridors

Management Intent

The intent of this plan is to preserve the wetlands in a natural state in order to protect their hydrologic, recreational, and habitat functions. This will be accomplished by

- retention in public ownership of Class I and II wetlands whenever feasible as required in the Willow Sub-Basin Plan;
- classification of the wetlands as Wildlife Habitat/Water Resources Lands;
- establishing a system of publicly owned protective buffers surrounding the wetlands; and
- other management practices as discussed in greater detail below.

For purposes of this plan, wetlands are divided into three classes (see the Willow Sub-basin Plan guideline, page 96), which are described below:

Class I: wetlands larger than 100 acres and all wetlands with a locatable stream outlet.

Class II: wetlands between 40 and 100 acres with no outlet.

Class III: wetlands less than 40 acres with no outlet.

Classification/Reservation

Class I and II wetlands located within state ownership will be classified Wildlife Habitat/Water Resources. The state lands shown as public retention areas on the Master Plan are the lands that will be classified Wildlife Habitat/Water Resources except as noted elsewhere in this plan. Class I and II wetlands located within borough ownership will be surveyed out during the agricultural tract survey, as delineated on the Master Plan, and retained in public ownership.

Planned Actions

The farm tracts have been laid out and the land survey will be conducted in a way that reduces to a minimum the wetland areas transferred to private ownership (see page 50, Agriculture, for further discussion of land survey).

Public access to most of the wetland areas is provided by either road access, corridors of public land, or section line easements. The only exceptions to this are a few small wetland areas surrounded by Class II and III soils that are to be conveyed to private ownership as part of the farm tracts.

Management Guidelines

Wetland buffers.

1. Class I and II wetlands and certain surrounding lands (buffers) should remain in a natural state and in public ownership whenever feasible. A Class I or II wetland buffer shall generally include all soils of Class IV or worse agricultural capability (e.g., Class V, VI, etc.) that lie adjacent to the wetland or the buffer will be 100-feet back from the edge of the woody vegetation, whichever provides the greater buffer width. Maximum buffer width, however, is 300 feet. Exceptions to this guideline may be made to reduce survey costs when non-class II and III soils extend as a spur from the wetlands into class II and III soils. In those cases the small spurs of wetlands may be included in the agricultural tracts. Restrictive use covenants will be used to require that no development occurs within 100 feet of the wetlands.

2. Class III wetlands may be sold as part of a farm tract if surrounded by agricultural land subject to the proposed land sale. Draining, clearing, or other modification of a Class III wetland for agricultural uses must be approved by the Matanuska-Susitna Borough or the Department of Natural Resources and must conform to the applicable Army Corps of Engineers permit requirements (e.g., various sections of the River and Harbor Act of 1899 [33 U.S.C. 401 et seq.], section 404 of the Federal Water Pollution Control Act Amendments of 1972 [33 U.S.C. 1344], and section 103 of the Marine Protection Research and Sanctuaries Act of 1972 [33 U.S.C. 1413]). Restrictive covenants will be used to require that no development occurs within 100 feet of the wetlands unless approved as outlined above.

3. Where the configuration of the wetland is such that survey along the meander of the wetland would be excessively expensive an aliquot part (rectangular) survey rather than a meander survey may be used or the number of meanders may be reduced. This may result in portions of the wetland being conveyed to private ownership. Such conveyance will be kept to a minumum. Restrictive use covenants and, where appropriate, public access easements will be applied to ensure that those portions of the wetland and associated buffer conveyed to private ownership remain in a natural state and that public access and use are maintained. No development may occur within 100 feet of the wetland.

Stream buffers.

4. Buffers will be retained in public ownership along Fish Creek and its tributaries. Generally, each buffer will include all soils Class IV or worse adjacent to the stream or the buffer will be 200 feet back from the ordinary high water mark, whichever is greater. The purpose of the buffer is to protect water quality, provide wildlife habitat, and provide for public access and use. Exceptions to this guideline may be made to reduce survey costs when non-class II and III soils extend as a spur from

the stream into class II and III soils. In no case will the buffer be less than 200 feet. This constitutes a special exception to the guideline on Fish Creek in the Willow Sub-basin Plan (page 127); it is consistent with the intent of that plan in that the 200 foot minimum width will provide the same degree of protection that is provided when the adjacent soils are class II and III. Where necessary to provide good access along Fish Creek the buffer may be wider than 200 feet (i.e. where necessary to get around swampy ground). This will be determined at the time of survey.

5. Buffers will be retained in public ownership along Homestead Creek (entering Flathorn Lake in Section 18) and the unnamed creek entering Flathorn Lake in Section 12, Township 16 North, Range 7 West, and their tributaries where there is a definable bluff along the stream. These buffers will include everything below the bluff line and a 50 foot wide strip along the top of the bluff. Where there is not a definable bluff, the buffer will be 100 feet from ordinary high water on either side of the stream. Where the bluff line cuts away from the stream into the agricultural tracts, the Master Plan Map is the guide as to where the boundary and the buffer should be. It is not the intent to enlarge the buffer beyond what is shown on the map. The Master Plan Map at 1:24,000 scale is on file at the Southcentral District Office of the Division of Land and Water Management and in the geoprocesser at the Division of Geological and Geophysical Surveys.

6. All surface-disturbing activities on state lands with potential of affecting anadromous fish streams should have on-site review during the preliminary planning stage.

Stream and wetland buffers.

7. If adequate funding is obtained, a representative from the Department of Fish and Game will accompany personnel from Division of Land and Water Management or Division of Agriculture into the field during tract survey to assist in determining specific problems to be addressed in farm conservation or development plans, such as stream crossings and buffers along streams or wetlands.

8. Surveys will be conducted so as to include the buffers in the wetland or stream area and so as to distinctly mark the boundary between private and public ownership.

9. State land management decisions inside the buffer areas that involve a disposal of the state's interests or that might affect the habitat, recreational, or watershed values of the buffers will require consultation with the Department of Fish and Game and the Division of Parks.

10. The minimum width of the buffer along either streams or wetlands may be increased on a case-by-case basis where it is determined that the minimum width specified in this plan is not adequate to protect water quality. Examples of factors that could lead to requiring wider buffers are intensive use of fertilizers or pesticides adjacent to the buffers, slope, or especially permeable soils. Prior to survey of the tracts, representatives of the Divisions of Land and Water and Agriculture, the

Department of Fish & Game, and the Matanuska-Susitna Borough should make site visits to check on the adequacy of the buffers in several different locations. The visit may result in additional guidance on the types of situations requiring a wider minimum buffer width. If it is determined that a wider buffer width is needed as a result of on-the-ground inspection at the time of survey, tract boundaries should be adjusted at that time. If it is determined that a wider buffer is needed after the tract has been survyed, the additional buffer width will be established through the farm conservation plan by requiring a development set back and/or appropriate best management practices.

Development adjacent to wetlands and streams.

11. Use of water from any wetland or stream for agricultural or domestic purposes or discharge into streams or wetlands must conform to applicable permit requirements of the Division of Land and Water Management for water use permits (Certificate of Appropriation); Corps of Engineers Clean Water Act, section 404, for permits of the River and Harbors Act; section 10 permits, Department of Environmental Conservation, for various water quality standards.

12. Winter access only should be used in or across wetlands whenever feasible.

13. Cutting in wetland buffers. See Forestry Section, guideline 15, page 59.

14. Cutting in stream buffers. See Forestry Section, guideline 16, page 59.

15. Farmers who own a tract divided by a stream corridor that is retained in public ownership will be allowed access across the stream. The location and type of crossing will be specified in the farm conservation plan following consultation with the Department of Fish & Game.

16. In any further planning for or studies of Fish Creek local property owners or residents should be consulted (see appendix for list of those that have expressed interest in this plan).

Settlement

Management Intent

As noted in Chapter 2, non-agricultural settlement is primarily limited to the Moraine Ridge subunit. Most of the land in this subunit is owned by the Matanuska-Susitna Borough. Through the use of its lands, the borough will accomplish the following objectives:

- contribute to the development of basic industry, providing employment for borough residents;
- provide land to the private sector for all feasible uses - industrial, commercial, and residential;
- contribute to the maintenance of the life-style traditionally valued by borough residents;
- preserve lands suitable for agricultural purposes;
- provide revenue through land sales to support needed capital improvements within the borough; and
- use borough lands as appropriate to meet identified public needs.

Classification/Reservation

Borough land on Moraine Ridge will be reserved for future use for residential, agricultural, commercial, or industrial purposes. The Master Plan Map shows the general levels of density of such uses intended to occur on this land.

Most state land within the study area has been included within an agricultural tract or designated for public retention for use as wildlife habitat, recreation, or protection of water quality. State land in the Moraine Ridge subunit is classified as Wildlife Habitat/Public Recreation (see the sections on fish and wildlife and recreation in this chapter). In the Fish Creek subunit a few small parcels of land have been preliminarily identified as appropriate for settlement other than large scale agriculture. These are areas with good soils that were too small to make into an agricultural tract. They either have planned or potential access or are larger than 20 acres. They are the areas in the following sections that have good soils but that are not included in agricultural tracts: Sections 15, 22, 26, 27, 33 in Township 17 North, Range 6 West, Seward Meridian and Section 6, Township 17 North, Range 5 West, Seward Meridian. See pages 68 and 69 for maps showing these areas. For the present they will be included in the Wildlife Habitat/Water Resources classification being placed on surrounding lands; however, suitable portions of these lands may be reclassified to Settlement or Agricultural Lands following a more detailed review of their suitability as part of DNR's Land Availability Determination System. This specific reclassification action will not require an amendment of this plan.

Planned Actions

General Development Plan. A general development plan for the Moraine Ridge subunit will be prepared by the Matanuska-Susitna Borough prior to any disposals to ensure proper development of the entire unit. The plan will consider all uses within the unit. Following the development of the plan, land disposals tied to the plan will occur as dictated by need and demand. The plan will be based on the guidelines listed below.

Support facilities and residential development. There will be a need for land for agricultural and community support facilities in the future as the Fish Creek agricultural area and the settlement area along Moraine Ridge develop. It is intended that these support facilities be located at the southern end of the ridge. Lands not committed for agricultural purposes or reserved for community/agricultural support facilities will be allocated for residential development where feasible. As was previously described, because of its geographical location, the Moraine Ridge subunit has long range potential for being a major settlement core west of the Little Susitna River between Willow and the proposed Point MacKenzie industrial port, following construction of a highway from Point MacKenzie to Willow. It is anticipated that at least the southern part of the Ridge will be served by community water and sewerage systems and that residential density there will be relatively high. Density will diminish toward the north to blend into low recreational densities near the Nancy Lake State Recreation Area.

Use of timber. Prior to development of this area as settlement, there may be a demand for commercial-quality house logs, saw logs, or personal use firewood sales in the immediate area. Making the Moraine Ridge timber available for selective cutting will help satisfy the demand for these products. This will be allowed only if compatible with the intended use of the area. See Forestry Section, guideline 18, page 59.

Agricultural Lands. Three agricultural tracts have been identified at the north end of Moraine Ridge in Sections 27 and 34 of township 18N, range 5W, Seward meridian and sections 3 and 4 of township 17N, range 5W, Seward meridian. These are several miles from the road system planned for initial construction. Therefore they will not be sold until the general development plan for Moraine Ridge is completed, and local roads for this subunit have been constructed. There are a few other scattered parcels of class II and III soils in this subunit. The decision on the use of these lands will be made as part of the general development plan for Moraine Ridge. Those in the southeast corner of the unit may be needed for commercial or industrial support facilities. Other parcels are less than forty acres.

Small lot sales within the agricultural areas. It is anticipated that small areas of usable land will be identified during the survey of the agricultural tracts that could be utilized for rural residential purposes. These are tracts from 5-20 acres that are not contiguous to agricultural areas but that have good capability for residential uses. Those on state lands will be referred to DNR's Land Availability Determination System (LADS) to determine their suitability for disposal for residential or private recreational uses.

Management Guidelines

Moraine Ridge.

1. Settlement development within the Moraine Ridge area will take into consideration the following criteria:

   a. Existing private inholdings should be integrated into the general development plan. Greenbelt buffers should be designed between existing private property and proposed settlement where appropriate.

   b. Open spaces, park lands, existing trails and greenbelts should be included in the design and integrated into an interconnecting system providing public access to significant bodies of water as well as habitat and corridors for animal movement.

   c. Needed community and neighborhood service centers should be provided for in the general development plan.

   d. Road systems should be developed off the proposed main access route through Moraine Ridge. Road access to all existing private parcels and to public recreation sites on Cow, Delyndia and Hock Lakes should be provided for in the design.

   e. Principal concentration of development will occur at the southern end of the unit near the intersection of the Chulitna River - Goose Bay Road corridor and the Moraine Ridge Road.

   f. Borough land to be sold for residential use or recreational cabins should be sold in phases.

2. In preparing the general development plan the borough should involve the public including existing community or homeowners' associations.

Other lands.

3. On state land, parcels identified for possible disposal for non-agricultual purposes during the agricultural tract survey will be reviewed by DNR as part of the Land Availability Determination System (LADS). Consideration will be given to the need for sites for public facilities prior to making a decision to dispose of these lands. The potential for conflict between adjacent agricultural and residential uses will also be considered. If found appropriate for private ownership, the parcels will be disposed of according to a schedule to be established by DNR's LADS.

4. Certain borough lands, listed below, will be retained in public ownership and the decision on their use will be reserved for the future. These lands include small pieces of class II and III soils, generally less than 40 acres. These lands, listed below, may be appropriate locations for public facilities. Some of them also have recreation potential.

   Section 7, Township 16 North, Range 5 West; a small parcel bounded by two roads and the Iditarod trail.

   Section 1, Township 16 North, Range 6 West; a small parcel bounded by the road, the Iditarod trail, and Fish Creek.

   Sections 3 and 4, Township 16 North, Range 6 West; several small parcels north of the road.

   Section 20, Township 16 North, Range 6 West; a peninsula bounded by private property on the west, a stream on the northwest, private property on the north, and Fish Creek on the east and south.

5. State lands northwest of Homestead Creek in Sections 14, 15, 22, 23, 27, and 33, Township 17 North, Range 6 West, Seward Meridian, should be considered for non-agricultural or agricultural homesteads or other disposals. These lands include small pieces of class II and III soils that are not large enough to make into agricultural tracts as well as some wetlands. There will be road access at the south end of Section 33. There will also be road access to the southeast corner of Section 22. It is intended that this road include bridges or culverts to cross both streams in Sections 22 and 23. The continuing road to Susitna Corridor shown on the Master Plan will probably be a winter road. See also the guidelines in the Wetlands Section which will apply to any disposal here.

6. Suitable portions of state land in the following sections not included in agricultural tracts should be considered for settlement, including use for public facilities: Section 26, Township 17 North, Range 6 West, Seward Meridian; and Section 6, Township 17 North, Range 5 West, Seward Meridian. Each has small parcels of class II or III soils surrounded by wetlands and will have road access. See maps on page 68 and 69. See also the guidelines in the Wetlands Section which will apply to any disposal here. Prior to any disposal in Section 6, consideration should be given to rerouting the Yohn Lake to Susitna River Trail from existing private property through public land.

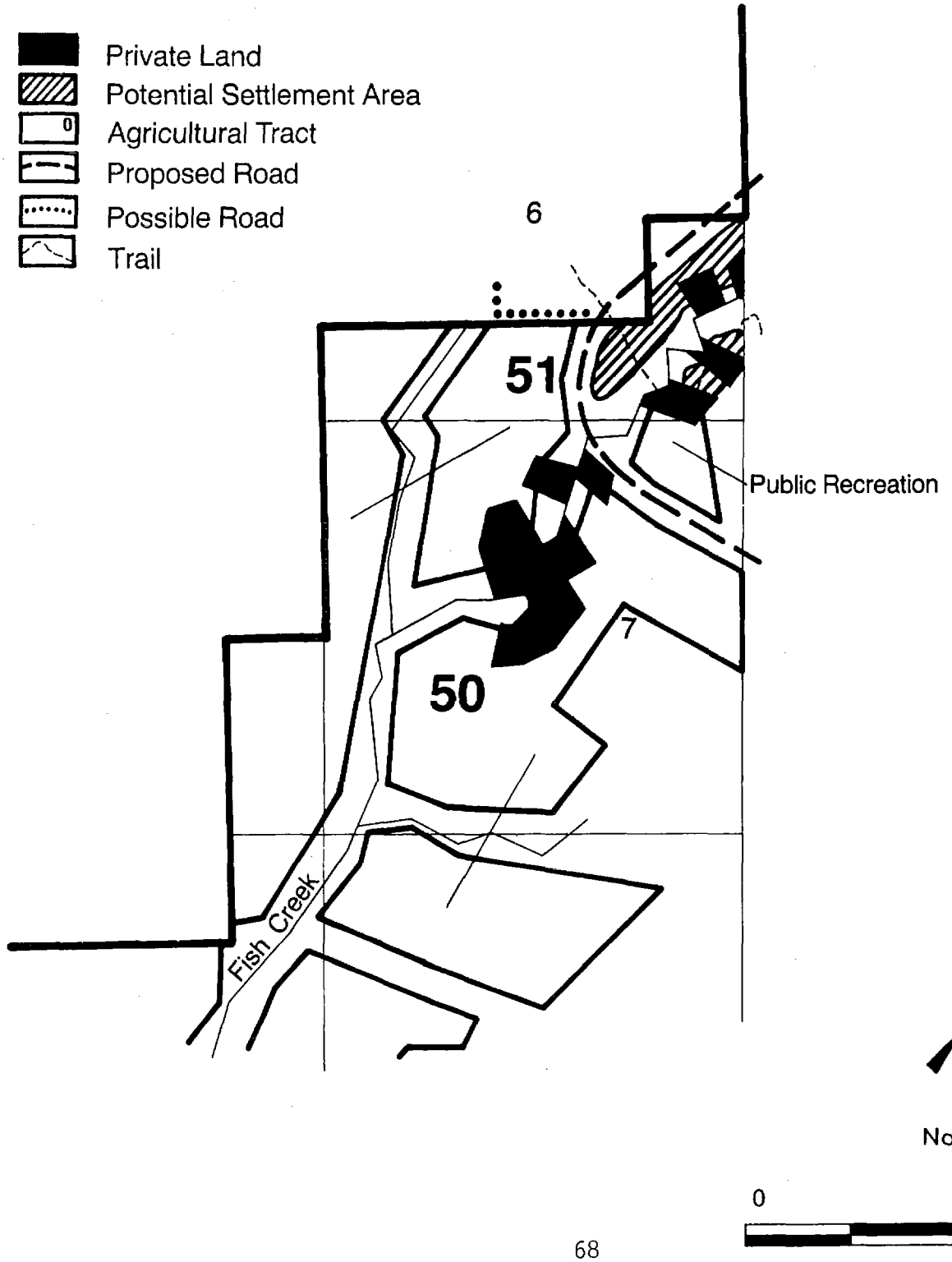
FISH CREEK

Management Plan

Settlement One

T 17N R5W

Legend



FISH CREEK

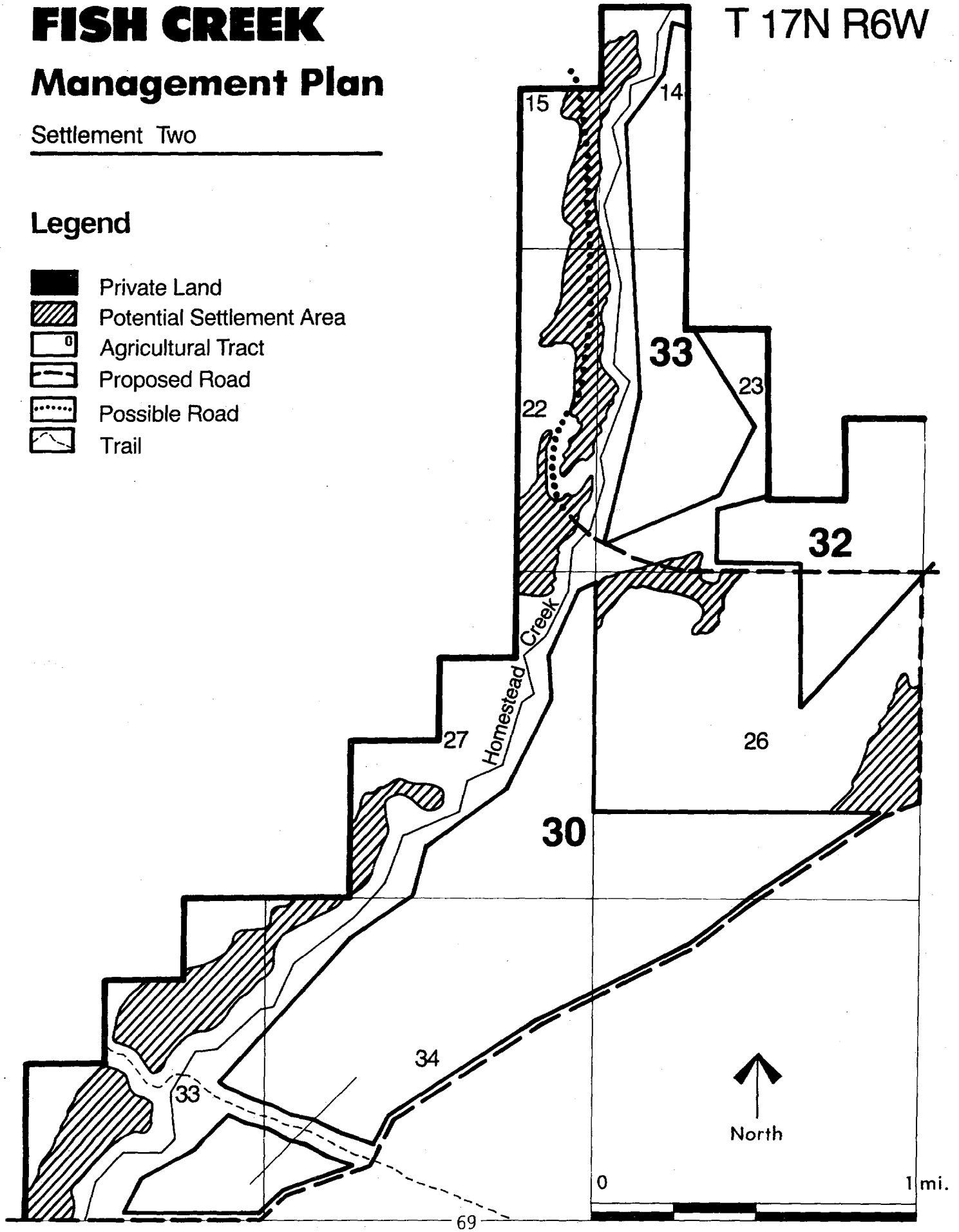
Management Plan

Settlement Two

T 17N R6W

Legend

- Private Land
- Potential Settlement Area
- Agricultural Tract
- Proposed Road
- Possible Road
- Trail



Transportation

Management Intent

The primary management intent for the transportation corridors is to retain them in public ownership and utilize them to provide access both through the unit (the primary corridors) and to the agricultural and settlement areas within the planning area (the secondary corridors). Where these corridors replace existing trails, trail uses will occur in the corridor.

Classification

Following preliminary engineering and design work that locates the corridors precisely, those traversing state lands will be reclassified as Transportation Corridors. This specific reclassification will not require an amendment to this plan unless the alignment is significantly changed. In the interim, the corridors will be included in the classification of the adjacent lands (generally either Agricultural Lands or Wildlife Habitat/Water Resources Lands; where the corridors go between these classifications, they will be classified Agricultural Lands).

Planned Actions

Primary roads. Two primary road corridors will be located within the unit (See Master Plan, page 47). These are an east-west corridor, part of the Chuitna River/Goose Bay corridor, and a north-south corridor, part of a corridor between Point MacKenzie and Willow.

Partial construction of a road in the Chuitna River/Goose Bay Corridor (ADL 57588) has already occurred at Point MacKenzie. Should the state decide to build a road from Point MacKenzie to lands west of the Susitna River, including the Beluga coal fields, this corridor would provide the shortest, most cost-effective overland route. The width will be 400 feet in order to allow for alteration in alignment during engineering of this corridor and eventual inclusion of frontage roads and utility line corridors. Following final road engineering studies, the 400 foot total width may be reduced, with DOT/PF concurrence.

There is an existing right-of-way reservation (ADL 57588) for an east-west corridor south of the alignment identified in this plan. After preliminary engineering studies determine the exact alignment, the Department of Transportation will relinquish the reservation provided that the Matanuska-Susitna Borough reserves the right-of-way shown in this plan at no cost to the state.

The Point MacKenzie - Willow corridor has been evaluated by DOT as an option for access between Point MacKenzie and the Parks Highway at Willow as part of the Knik crossing study. At the present time DOT believes a corridor to Houston to be preferable as the north approach to the Knik crossing because of lower initial cost. Nevertheless, it is expected that eventually there will be a major north-south road through the Fish Creek area connecting Point MacKenzie and Willow. A portion of the right-of-way for the north-south corridor through the Fish Creek project has already been applied for (ADL 216410). The total width of this corridor will be 400 feet. This width will allow for a frontage road system and utility lines.

Two alternative locations for the north/south corridor within the Fish Creek study area are were considered:

1) along the western toe slopes of Moraine Ridge; and

2) west of Moraine Ridge through the agricultural area.

The corridor along the western toe slopes of Moraine Ridge was selected by the Department of Natural Resources and the Matanuska-Susitna Borough as the preferred alternative following public and interagency review. This alternative is preferable because it is more compatible with the intended land uses. It allows for a better farm layout with 55 tracts instead of 59. Several of the tracts are larger. Also a road at the base of Moraine Ridge separates agricultural uses on the west from residential uses on the east. It will provide faster access from the Anchorage and Point MacKenzie areas to what will eventually be the most heavily settled part of the study area, the southern end of Moraine Ridge. (This will be especially true if the Knik crossing is built.) It will put the intersection of the main north-south and east-west roads at the south end of Moraine Ridge where commercial development is intended to occur. (It should be noted that the Department of Transportation and Public Facilities prefers the alternate corridor shown in the Appendix.)

Preliminary cost estimates by the Matanuska-Susitna Borough Public Works Department indicated that there was not a significant difference in the cost of the two alternatives (see appendix). Therefore cost was not a factor in the selection of the Moraine Ridge corridor.

At the time this plan was developed, not enough information was available to determine the exact alignment of the north-south road within the Moraine Ridge corridor. (Because the Department of Transportation and Public Facilities analyzed the alternate corridor as part of the Knik Crossing study, better information is available for that route.) The additional information needed about the selected corridor is most likely to be obtained through a preliminary engineering study. A revision in the alignment may necessitate a minor revision in the tract layout. Based on the additional information provided by a preliminary engineering study, the borough and the state should again compare the two alternative corridors. If, based on better information, it is determined that the Moraine Ridge route is substantially more expensive than the alternate route, or that is not suitable for an arterial highway, the alternate corridor should be reconsidered. (See guideline #8 below.)

The right-of-way application ADL 216410 is for the alternate corridor shown in the Appendix. This will be held in pending status by the Department of Natural Resources until after the steps outlined above are taken and the route decison is final.

Secondary roads. A secondary, or local, road system is needed to provide access from the primary roads to farm tracts. Alignment of secondary roads will generally follow the corridors identified in this plan.

These corridors were identified through site design workshops and represent the least amount of overall construction cost and environmental impacts (e.g., anadromous fish stream crossings), while accessing the greatest amount of area. All secondary road corridors will be 100 feet wide which conforms to state and borough standards for secondary roads.

Initial access. There are several options for providing initial access to the project. These are summarized in table on page 92 in Chapter Four, Implementation. The two main options are from the south, via a 4.7 mile road from Point MacKenzie that requires crossing the Little Susitna River, or from the north via the Long Lake Road or Nancy Lake Road. The decision on which option to select for initial construction will be made during implementation, based on the amount of available funding. However, this plan recommends that initial access be constructed from the south, despite its greater initial cost. Access from the south will connect the Fish Creek and Point MacKenzie agricultural areas, will provide shorter access to the Wasilla and Anchorage areas for future residents of the Moraine Ridge area, will provide improved access to the Little Susitna River for Anchorage and Valley residents for recreational use, and will provide shorter access to fishing opportunities afforded by Fish Creek for Anchorage and Valley residents. This is particularly true for Anchorage residents if the Knik Crossing is constructed. It is 32 1/2 miles from Wasilla to the south project boundary via the south access and 35 1/2 to 39 1/4 miles (depending on which north access is used) from Wasilla to the north project boundary.

Responsibility for Road Construction. If the initial purpose for roads in the Fish Creek area is as farm roads, this plan assumes that the Matanuska-Susitna Borough will construct the roads upon receipt of funding from the Legislature.

The borough will build the initial roads to minimum standards to provide access to the farm tracts. The width of the corridors and the initial construction of the roads will allow for eventual upgrading to state standards. At such time as the roads in the primary corridors are needed as arterial highways, it is expected that the Department of Transportation and Public Facilities will assume responsibility for them.

The intent is that initial construction should be the responsibility of whichever agency can do it most quickly and inexpensively.

Railroad. If the Point MacKenzie area develops into an industrial complex with a port site, a railroad connection between Point MacKenzie and the interior or the Beluga area may be needed. A railroad corridor across Moraine Ridge was recommended in a reconnaissance study prepared by a private firm for the Matanuska-Susitna Borough on the feasibility of an Alaska Railroad

extension to Point MacKenzie. A separate evaluation done as part of this plan determined that a better route for a railroad may be a route west of Moraine Ridge, parallelling the alternate north-south road corridor, because of better soils and fewer grade problems. DOT/PF objects to placing a railroad and a highway in the same corridor because of problems with intersections. No corridor is reserved for a railroad in this plan because it would delete additional land from the agricultural tracts, because the likelihood of a railroad through this unit is speculative at present, and because there is insufficient data to determine the best route. Therefore, attempting to locate a right-of-way at this time would be of little value. If at some time after the sale of agricultural tracts it is decided that the railroad should go through this area, condemnation of some parts of some agricultural parcels may be necessary.

Access to the Susitna Corridor. Access to the Susitna Corridor will be possible from the road in Section 36, Township 17 North, Range 7 West; from the road in Section 29, Township 17 North, Range 6 West; from an extension of the road in Section 23, Township 17 North, Range 6 West; from the road in Section 6, Township 17 North, Range 5 West; and from Section 29, Township 18 North, Range 5 West. The phase 3 roads shown at these locations on the Master Plan will not necessarily be built, but the option will be available. Some of these corridors may be suitable only for winter access.

Management Guidelines

1. Farming of right-of-way corridors. See Agriculture Section, guideline 3, page 51.

2. The requirement (11 AAC 53.450) for retention of a 300 foot wide buffer strip along highways through state lands is waived through the Fish Creek planning area where roads pass through farm tracts because:

   a) the width of the corridors is adequate to allow for such uses as utility lines and trails;

   b) agricultural uses are low intensity and do not need to be screened from the view of highway users;

   c) buffers would result in eliminating a considerable amount of acreage from agricultural production; and

   d) allowing agricultural use to the edge of the corridor will open up views of Denali and Mt. Susitna.

3. Alignment of road corridors should allow for minimum, long-run financial costs, including all construction, operations, and maintenance costs.

4. Impact on the aquatic, terrestrial, aesthetic, and cultural features of the environment should be as minimal as possible.

5. Timber salvage on right-of-ways: see guideline 12, Forestry Section, page 58.

6. If engineering studies determine that the Beluga corridor identified in this plan is feasible, the state will relinquish the existing right-of-way reservation to the south, and the borough will reserve a right-of-way through borough lands along the alignment shown in this plan at no cost to the state. These actions will occur simultaneously.

7. First generation road construction on all roads will be built to the minimum standards listed below. (These are standards acceptable to Matanuska-Susitna Borough for resource development roads;

   - 24 foot surface (includes shoulders)
   - minimum of two feet of stable compacted gravel or other competent fill material;
   - vee ditches;
   - culverts or bridges as needed for cross drainage to maintain existing drainage patterns;
   - maximum of 10 percent grade;
   - 2:1 side slope on cut/fill surfaces;
   - roadside revegetation if necessary for soil stabilization, according to the Department of Transportation's 1981 Standard Specifications for Highway Construction.

8. A preliminary engineering study of the north-south route should be done as the first step in development of this area. Following this study, the Matanuska-Susitna Borough, the Department of Natural Resources, and the Department of Transportation/Public Facilities should again compare the two alternative north-south corridors. If the new information indicates that the alternate corridor is significantly better, an amendment of this plan should be requested. Public comment must be obtained before a final decision to change the location of the north-south corridor is made. If during the preliminary engineering study it is determined that the Moraine Ridge corridor is feasible, the alignment may be changed as necessary, provided that the general concept of the road as the boundary between the agricultural tracts and the settlement lands is adhered to and that the road's encroachment on class II and III soils is kept to a minimum.

9. The preferred route for the secondary road to the south end of Flathorn Lake is through the Susitna Flats Game Refuge, pending approval from the Department of Fish and Game at the time funding is available for preliminary engineering studies. The Department of Fish and Game should consult concerned interest groups in making this decision. The soils are better for road construction in the Refuge and a road there would improve access to the Refuge. The alternate route along the section lines (and project boundary) will be used if the Department of Fish and Game does not approve the route through the Susitna Flats Game Refuge.

10. The road system shown on the Master Plan may be constructed in phases in order to keep initial development costs as low as possible. See Road Phases map, page 77. Phase 1 includes only those roads necessary to provide access to all farm tracts, excluding three at the north end of Moraine Ridge (see Settlement section, page 64.) Phase 2 includes those roads necessary to complete an internal circulation system within the farming area and to provide access to the Susitna River and recreation sites on Flathorn Lake and Fish Creek. Phase 3 includes the roads on Moraine Ridge that will provide access to settlement areas, recreation areas on the lakes on the ridge, and the three agricultural tracts at the north end of the ridge; roads that provide access to existing private lands on Moraine Ridge and around Flathorn Lake; and roads that provide access to Susitna Corridor. The Moraine Ridge road system will be designed in greater detail as part of the Moraine Ridge general development plan.

11. Access to existing private land: see Chapter 3, Agricultural Section, guideline 11, page 53, and Settlement Section, guideline 1(d).

12. A 100-foot-wide corridor will be reserved in public ownership for all phase 2 roads and phase 3 roads that provide access to the Susitna corridor and the road across tract 52. Other phase 3 roads that provide access to existing private parcels near Redshirt and Flathorn Lakes and Fish Creek will be reserved by an easement through the agricultural tracts. (See also agricultural guidelines #3 and 11, pages 51 and 53, respectively.)

13. The bridge across the Fish Creek tributary between Sections 6 and 7, Township 16 North, Range 5 West should be wide and high enough to allow the Iditarod Trail to cross under the road at this point. The Iditarod Trail Committee should be consulted during the design of the crossings of major roads and the Iditarod Trail. Where possible, above grade corssings should be used rather than culverts.

14. All material sites for road construction and maintenance should be located a sufficient distance from the road so as to reduce adverse visual impacts to a minimum. 300 feet from the edge of the right of way should be the minimum distance.

15. If the selected corridor for the proposed Susitna Hydroelectric transmission line runs through the Fish Creek area, the location as shown on the Road Phases Map, page 77, is generally acceptable, because it would have the least impact on agricultural soils and probably lower visual impacts. However, this location should be reevaluated during the permitting process based on an on-the-ground evaluation; more detailed information available at that time, and public comment. Visual impact should be further evaluated at that time to determine whether the power line would be visible from the north-south road to the east and whether it would detract from the views of the mountain to the west. If feasible, the transmission line should be routed around tracts 37, 40 and 44.

16. Wherever possible electric power lines to this area should be placed in the road rights-of-way. In determining which side of the road to put the lines on, impact on the view of road users must be considered. In addition, section line easements will be available for power lines. Where additional easements are necessary they will be identified at the time of survey. Section line easements will be considered a secondary system to be utilized only if road corridors will not provide a reasonable route for power or other utility distribution lines.

17. Prior to constructing a road across the Little Susitna River, the project should be coordinated with the Department of Fish and Game and Division of Parks to provide for adequate management of the resulting increase in use of the Little Susitna River.

Legend

- Planning Area Boundary
- Private Land
- Agricultural Tract
- Public Recreation
- Primary Road 1st Phase
- Secondary Road 1st Phase
- Primary Road 2nd Phase
- Secondary Road 2nd Phase
- Secondary Road 3rd Phase
- Trail
- Trail Realignment

Susitna Corridor Management Unit

Nancy Lake State Recreation Area

T 18N

T 17N

Moraine Ridge Management Unit

Homestead Creek

Iditarod Historic Trail

Burn's Cabin

Hock Lake

T 17N

T 16N

Little Susitna Corridor Management Unit

R 7W R 6W

Flathorn Lake

R 6W R 5W

Susitna Flats State Game Refuge

Susitna Hydroelectric Transmission Line—Proposed

North

0 1 mi.

FISH CREEK
Management Plan

Road Phases

Fish and Wildlife

Management Intent

The intent of this plan is:

- to maintain or improve the existing production and quality of fisheries habitat in the Fish Creek system and in the other creek systems in the study area; and
- to provide public access to Fish Creek, Homestead Creek, the unnamed creek at the north end of Flathorn Lake and their tributaries in addition to Class I and II wetlands for public hunting and fishing opportunities.

Classification/Reservation

- Class I and II wetlands on state land that are to be retained in state ownership shall be classified as Wildlife Habitat/Water Resources Lands. Retention in state ownership will significantly assist in protection of these important habitat areas, and will preserve public access to them. See wetlands guidelines 1 and 3, page 61.
- Most wetland areas and associated buffers on borough land will be retained in public ownership. See wetlands guidelines 1, 2, and 3, (page 61) for exceptions.
- Fish Creek, Homestead Creek, the unnamed creek at the north end of Flathorn Lake, their tributaries and associated buffers on state land (as shown on the Master Plan), will be classified as Wildlife Habitat/Public Recreation Lands. These creeks, their tributaries, and associated buffers on borough land (as shown on the Master Plan) will be retained in public ownership. Retention of these stream corridors in public ownership will preserve public access to these areas and remove them from possible over-development of surface resources that might negatively impact the habitat, wildlife populations, and existing and potential public use.
- The state-owned lands in Sections 1 and 11 of Township 17 North, Range 5 West, Seward Meridian will remain classified as Wildlife Habitat/Public Recreation Lands.

Planned Actions

The Department of Fish and Game will further investigate the potential for a fisheries enhancement program for Fish Creek and its tributaries.

Overland public access will be provided to Flathorn Lake as shown on the Master Plan Map. Additionally, trail corridors to Cow and Redshirt lakes will be retained in public ownership.

Management Guidelines

1. Vegetative manipulation along publicly-owned lakeshores will be carried out only after consultation with the Department of Fish and Game.

2. Road crossings of streams will be minimized.

3. Section line access will not be vacated unless adequate alternate public access is provided. This will maintain public access to important hunting and fishing areas. See guideline 11, Agriculture Section, page 53.

4. Ground water or surface water appropriations may not reduce the surface water resources below the amounts needed for the maintenance of fish and wildlife resources and water-related recreation.

5. Public access will be maintained to and within the Iditarod Historic Trail corridor. As Fish Creek agricultural lands are developed, this corridor will become increasingly important as a wildlife area since it will remain in a natural condition. It will also provide public access to other fish and wildlife habitat areas.

6. The Department of Fish and Game will monitor the use of Fish Creek and its waters and take appropriate action to keep its use within the carrying capacity of the stream.

Recreation

Management Intent

The intent of this plan is to protect and manage the historic route of the Iditarod Trail for its historic and recreational values, to provide the opportunity for public recreational access to and use of streams, wetlands, and certain lakes within the study area, and to maintain existing trail systems as described in this section.

Classification/Reservation

Iditarod Trail. The Iditarod Historic Trail corridor will be retained in public ownership. The state portion will be classified Public Recreation Lands. A right-of-way centerline for the corridor has been surveyed and entered into the public land records system. The corridor is 400 feet wide, 200 feet either side of centerline. The Willow Sub-basin Plan established a trail corridor width of 600 feet but allowed for reductions provided that the quality of recreational use of the trail could be maintained. The corridor was reduced as a compromise measure in order to make more class II and III soils available for agricultural use, while maintaining the integrity of the trail. The 400-foot corridor is consistent with the intent of the Willow Sub-Basin Plan. The 400-foot-wide corridor includes approximately 190 acres of class II soils and 55 acres of class III soils.

The Burns' cabin site will be retained in public ownership and classified Public Recreation. The site is completely within the 400 foot wide Iditarod trail corridor.

Other Recreational Areas. Small, state-owned parcels on Cow, Delyndia, Hock and Flathorn Lakes will be retained in public ownership and managed for public recreation. These sites are currently classified Public Recreation (they were originally identified for this use by DNR as part of the public interest land identification project in 1980). Two additional borough-owned parcels on Flathorn Lake will also be retained in public ownership and managed for public recreation. The northern site, 20 acres, (in Section 18, Township 16 North, Range 6 West) is adjacent to the state-owned recreation site. The southern site, 60 acres (in the NW1/4 of SE1/4 and SW1/4 of the NE1/4, Section 30, Township 16 North, Range 6 West), is on the east shore of the lake, at the end of the proposed secondary road and includes a peninsula of land formed by Fish Creek as it flows out of the lake. A borough-owned parcel at the north end of Cow Lake will also be retained in public ownership and managed for public recreation. This will be expecially important if the Moraine Ridge road system goes through the state owned parcel at the southeast end of the lake (see the Master Plan Map, page 47).

Table 2

Public Recreation Lands on Lakes

Name	Approximate Acreage
Cow Lake	10 acres (existing; state) 40 acres (proposed; borough)
Delyndia Lake	10 acres (existing; state)
Butterfly Lake	0 - (all lands adjacent to the lake within the plan area are in private ownership.)
Redshirt Lake	0 - (all lands adjacent to the lake within the plan area are in private ownership.)
Hock Lake	10 acres (existing; state)
Flathorn Lake North	25 acres total 5 acres (existing useable acres; state) 20 acres (proposed; borough)
Flathorn Lake South	60 acres (proposed; borough)

Refer to Master Plan Map, page 47, for location of sites.

Public access to Fish Creek and its tributaries will be provided by a system of publicly-owned buffer areas along the streams. Along the southern three miles of Fish Creek, where the stream widens out into what is almost a lake, the buffer will extend 500 feet back from ordinary high water. This wider buffer begins in Section 16, Township 16 North, Range 6 West and follows the stream down to Flathorn Lake. See the Master Plan map at 1:24,000 on file at the Southcentral District Office of Division of Land and Water Management or in the geoprocessor at the Division of Geological and Geophysical Surveys. The purpose of the 500 foot-wide buffer is to ensure that an adequate amount of useable land at the top of the steep bluffs along the creek is retained in public ownership for future public use. In addition, two small sites on the south side of the creek, about one mile and three miles from its mouth, respectively, will be retained in public ownership for public use as access

points to the creek and possibly for tent camping. The sites are about 10 acres and 7 acres, respectively, (in addition to the 500 foot buffer). They will have road access and eventually parking and other facilities. Refer to page 61 for a description of the buffer areas further upstream and the township maps (in the official Department of Natural Resources copies of the final plan) for their location. Stream buffers will be retained in public ownership. On state land, they will be classified as Wildlife Habitat/Public Recreation Lands.

Recreation sites have been reserved at four primary road-stream intersections (see the Master Plan, page 47). These will provide access to Fish Creek and Homestead Creek. There is a 15 acre site at the intersection of the main east-west road with Homestead Creek and another 15 acre site west of the intersection of the east-west road with Fish Creek. Both are on borough land. There is a 25 acre site on state land at the intersection of the main north-south road with Fish Creek and a 10 acre site on state land at the intersection of a local east-west road with Fish Creek. These will be more precisely located in the field prior to agricultural tract survey by the Division of Land and Water Management in consultation with the Division of Parks. On state land all recreation sites will be classified Public Recreation and retained in public ownership to be managed by the Division of Land and Water Management in consultation with the Division of Parks. On borough land all recreation sites will be retained in public ownership.

Management Guidelines

Iditarod Trail

1. The historic Iditarod trail corridor is closed to mineral entry and coal prospecting and leasing.

2. Use of the present Iditarod race route will be preserved by a temporary easement that will be placed on the sale tracts if the historic route is not cleared for racing and ready for use by the time the agricultural lands are to be sold. The temporary easement will be relinquished when the historic route is ready for use.

3. Use of the historic Iditarod trail corridor by heavy-duty motorized vehicles will be authorized by permit only during the winter season when there is six inches of frost in the ground and a foot of snow cover. Such use will be permitted only if no other reasonable alternative exists. Crossings to allow equipment passage across the corridor shall be designated in the farm conservation plans and cleared during the clearing process (see Willow Sub-basin Plan guidelines - trail corridors). On land purchased from the state, these crossings should be approved by Division of Parks.

4. Tree cutting in the Iditarod trail corridor. See Forestry guideline 13, page 58.

5. Highway pull-offs will be designed so as to facilitate public viewing of the Iditarod Trail sled-dog race wherever such a facility also meets

other needs. If pull-offs are not practical, other provisions will be made for race viewing such as use of shoulders or separate areas which are cleared and used only when frozen. This shall be determined on-site with the Department of Transportation and Public Facilities, Matanuska-Susitna Borough Trail Committee, and the Division of Parks during the road design phase prior to disposal.

6. The Burns' cabin site will be left in its present condition without restoration of the actual cabin, since this site was designated a "level three" minimum management site by the Joint State/Federal Iditarod Trail Study. Minimum management means that the site should continue to be protected in accordance with established state and federal regulations.

Other Recreational Areas.

7. Stream and wetlands access sites.

   a. Public access to the streams and wetlands will be provided by publicly owned corridors along the streams, by intermittant road access to the streams, and by section line easements. Where appropriate, there will be additional public access to the streams via public access easements at certain farm tract boundaries. Such easements will be determined during the tract-survey phase prior to disposal by the Division of Land and Water Management and Matanuska-Susitna Borough in consultation with the Division of Parks.

   b. At the time of road design, adequate pullouts and parking should be provided for public use of streams and wetlands.

8. Lake sites. The two proposed public recreation sites on Flathorn Lake will be located on-site by the Division of Land and Water Management and the Matanuska-Susitna Borough in consultation with the Division of Parks. The approximate location of these sites is shown on the Master Plan Map, page 47. The sites will be surveyed out during the agricultural tract survey and retained in public ownership. A public boat launch facility should be developed on this lake; the Division of Parks and the Matanuska-Susitna Borough should jointly determine the best location.

9. Trails (other than Iditarod). The Yohn Lake-to-Susitna River and the Nancy Lake Loop trails will generally be preserved as they now exist. These trails generally fall within wetland areas, do not conflict with planned agricultural development, and present no conflict with wetland management. Use of these trails by heavy duty motorized vehicles will be authorized by permit only during winter months where there is at least six inches of frost in the ground and a foot of snow cover, or during periods when the topography and vegetation will not be damaged by their use. The Yohn Lake to Susitna River trail will be routed around the class II or III soils in tract 37. The Nancy Lake Loop trail will be rerouted around tract MR1. With these minor reroutings, these winter trails will go through large publicly-owned wetlands and thus fulfill the Willow Sub-basin Plan's requirements of a 300 foot wide corridor.

The Connecting Trail will also be retained in public ownership with a width of 100 feet up to its intersection with the historic Iditarod Trail. The trail corridor will be rerouted through lands to be retained in public ownership in Sections 31 and 32, Township 17 North, Range 5 West, Seward Meridian and Section 1, Township 16 North, Range 5 West, Seward Meridian (see Road Phases Map). The existing easement along the section line will preserve the connection with the Iditarod race trail until the historic trail is cleared.

The Susitna Flats branch trail, tractor trail, and Susitna Flats trails will be phased out after provision of adequate alternate access. These trails cross areas that are planned for agricultural development, and existing information does not indicate that they represent a significant recreational opportunity that should be kept intact as is. Alternate access will be provided via the planned primary and secondary road system which will have corridors wide enough to incorporate trails within them. The trails will be vacated following construction of the primary and secondary roads that will provide the alternate access.

Materials

Management Intent

Important sand and gravel resources needed for road construction and development of this area should be kept in public ownership. An inventory of sand and gravel resources is needed to determine the location of the best sources.

Classification

At this time the location of gravel sources is not well enough defined to classify any land as Materials Land.

Management Guidelines

1. Prior to road construction or survey of the agricultural tracts Division of Geological and Geophysical Surveys should inventory the sand and gravel resources in the study area. The best sites for borrow pits should be identified; these should be reviewed by Division of Land and Water Management, Division of Agriculture, Department of Transportation and Public Facilities, and the Matanuska-Susitna Borough. If needed to provide sources of gravel for road construction or other purposes these sites should be retained in public ownership. State lands retained for this purpose may be reclassified to Material Lands. If needed, the tract and road layout should be modified.

2. Gravel extraction from streams within the study area requires a permit from the Department of Fish and game and will be allowed only if no feasible and prudent alternative source is available.

3. Farm conservation plans must include proposed material borrow and use areas.

4. Material sites for road construction and maintenance. See Chapter 3, Transportation Section, guideline 14, page 75.

5. Generally, material sites should not be located within stream buffers. Exceptions may be made by Division of Land and Water or the Matanuska-Susitna Borough on a case-by-case basis in consultation with the Department of Fish and Game.

6. All material site areas will be subject to site-specific mining plans and other stipulations as needed to protect onsite and offsite environmental qualities.

Subsurface Resources

Management Intent

The study area covered by this plan is closed to locatable mineral entry and the issuance of coal prospecting permits. The area has little or no potential for hardrock minerals or coal, and surface mining is not compatible with agriculture or settlement. The lands within the study area that are not slated for agricultural or residential development are stream corridors and wetlands and their buffers. They have little or no known mineral potential, and have important fish and wildlife, water resource, and recreation values.

The study area is open to oil and gas exploration and leasing.

Classification

No land within the study area will be classified as Mineral Land. Oil and gas leasing may occur on land in any classification.

Planned Actions

Portions of the study area were included within the boundaries of the State of Alaska Oil and Gas Lease Sale 40, held in September, 1983. The oil and gas tracts were all located on borough lands. The portion of Township 16 North, Range 7 West, Seward Meridian that is within the study area was included within a lease that was purchased by a private individual.

Management Guidelines

1. Oil and gas lease tracts that coincide with agricultural tracts are subject to special restrictions on surface entry and facility siting. Plans of operation for oil and gas leases that are developed after the agricultural tracts are sold will be reviewed by the Matanuska-Susitna Borough. Whenever feasible and prudent, drill pads and other oil and gas facilities will be located on non-class II and III soils.

2. Wetland areas are open to winter seismic and other non surface disturbing activities. Deep drilling and associated production activities will not be allowed in wetland areas if a feasible and prudent alternative exists. This will allow for minimal disturbance to the environmental integrity of the wetlands. All actions within wetlands will be subject to the appropriate Corp of Engineers Permits.

Chapter 4
Implementation

Following adoption of this plan, a number of implementation steps are needed before the Fish Creek area is actually developed for agriculture. Most of these steps require funding before they can occur. Therefore exactly when or how implementation will occur is outside the purview of this plan. This chapter discusses the implementation steps and, in some cases, the options available.

Baseline studies. The studies listed below are in order of priority.

1. Sand and gravel inventory (see page 86). In conjunction with this an evaluation of potential archeological resources should be done with field surveys in areas of high potential. Priority should be given to areas where access corridors are proposed. Both the selected north-south corridor and the alternate corridor should be evaluated.

2. Water quality investigation and monitoring to: (1) determine its suitability for domestic and agricultural use and its susceptability to agricultural pollutants; and (2) establish a baseline of water quality and aquatic benthos conditions prior to implementation of the agricultural project and to monitor these conditions following agricultural development.

3. Surface water and ground water evaluations to determine the quantity of water available for agricultural needs and instream flow studies to determine the requirements of fish and wildlife for water from the three major streams within the project (with Fish Creek and its tributaries as first priority).

4. Meteorological investigation to determine wind direction and velocity for the purpose of determing whether or not windbreaks are needed and where. This study should begin at the earliest possible date as, ideally, five years of data is needed.

5. Wildlife and bird population study to determine baseline population data for large unqulates, small mammals, and birds in the different vegetation types represented within the agricultural project area.

6. Pesticide residue sampling to detect and measure any residues that may exist in the area prior to agricultural development.

Benefit/Cost Analysis

The Benefit/Cost Analysis should be expanded to include consideration of all values accessed by a road across the Little Susitna River, refined road costs, and a sensitivity analysis of the agricultural assumptions and benefits.

Project Roads

Funding is needed for the construction of roads within the project area. The Matanuska-Susitna Borough intends to build the initial roads to the standards described below. To reduce initial costs, the roads may be built in phases. The Borough's engineering staff estimates initial construction costs for phase 1 roads as $17 million and phase 2 roads $2.22 million, or $19.22 total. These costs are subject to modification following field engineering which will result in both a preliminary design and a more accurate cost estimate.

It is assumed that eventually the project area will be traversed by two major highways; (1) a north-south route connecting the Point MacKenzie area (and possibly Anchorage via a Knik Arm crossing) with Willow and points north on the Parks Highway; and (2) an east-west route connecting the Beluga area with the railbelt. Therefore, initial road design and construction in these corridors must allow for eventual upgrading to highway standards.
Phase 1 roads consist of approximately 44 miles of road that are needed to provide access to the project from Point MacKenzie and to all the tracts. Approximately 10 additional miles of road will be needed to complete the internal circulation system (Phase 2 roads). The mileage for Phase 3 roads has not been calculated since most of them are on Moraine Ridge and will be revised as part of the general development plan for Moraine Ridge.

For the short term it is expected that lower quality roads will be constructed as the first generation road system. The minimum standards should be gravel roads, 24 feet wide with a two foot stable gravel surface, 2:1 side slope, a maximum grade of ten percent, vee ditches with culverts and bridges where necessary. These standards should apply to both the access roads and the interior project roads. These standards are equivalent to the interior roads in the Point MacKenzie agricultural project.

Initial access

There are several options for providing initial access to the project. These are summarized on the table on page 92 and shown on the map on the next page. The south option is an extension of the Point MacKenzie Road and requires a bridge across the Little Susitna River. The north options all originate along the Parks Highway, north of Houston. Eventually the north-south corridor is expected to intersect the Parks Highway near Willow. The Department of Transportation and Public Facilities has looked at several possibilities for this intersection including use of the existing road south of Willow Creek or continuing the corridor straight across Willow Creek. The latter alternative would result in a straighter road but would bisect the proposed Willow Creek State Recreation Area along Willow Creek. For the short term, the north-south corridor could connect with the Parks Highway just north of the Nancy Lake Recreation Area via one of three alternatives: (1) the Nancy Lake Road (would cross Nancy Lake Recreation Area); (2) access south of Crystal Lake to the Long Lake Road (would cross private property); or (3) access from northwest of Florence Lake south around Crystal Lake to the Long Lake Road.

This plan recommends that initial access be constructed from the south, despite its greater initial cost (See Chapter Three, Transportation Section, page 72). If funds are not available to construct initial access from the south, the Florence Lake (3) access is the second recommended option. Though it would cost a little less to construct a road via Crystal Lake, that route

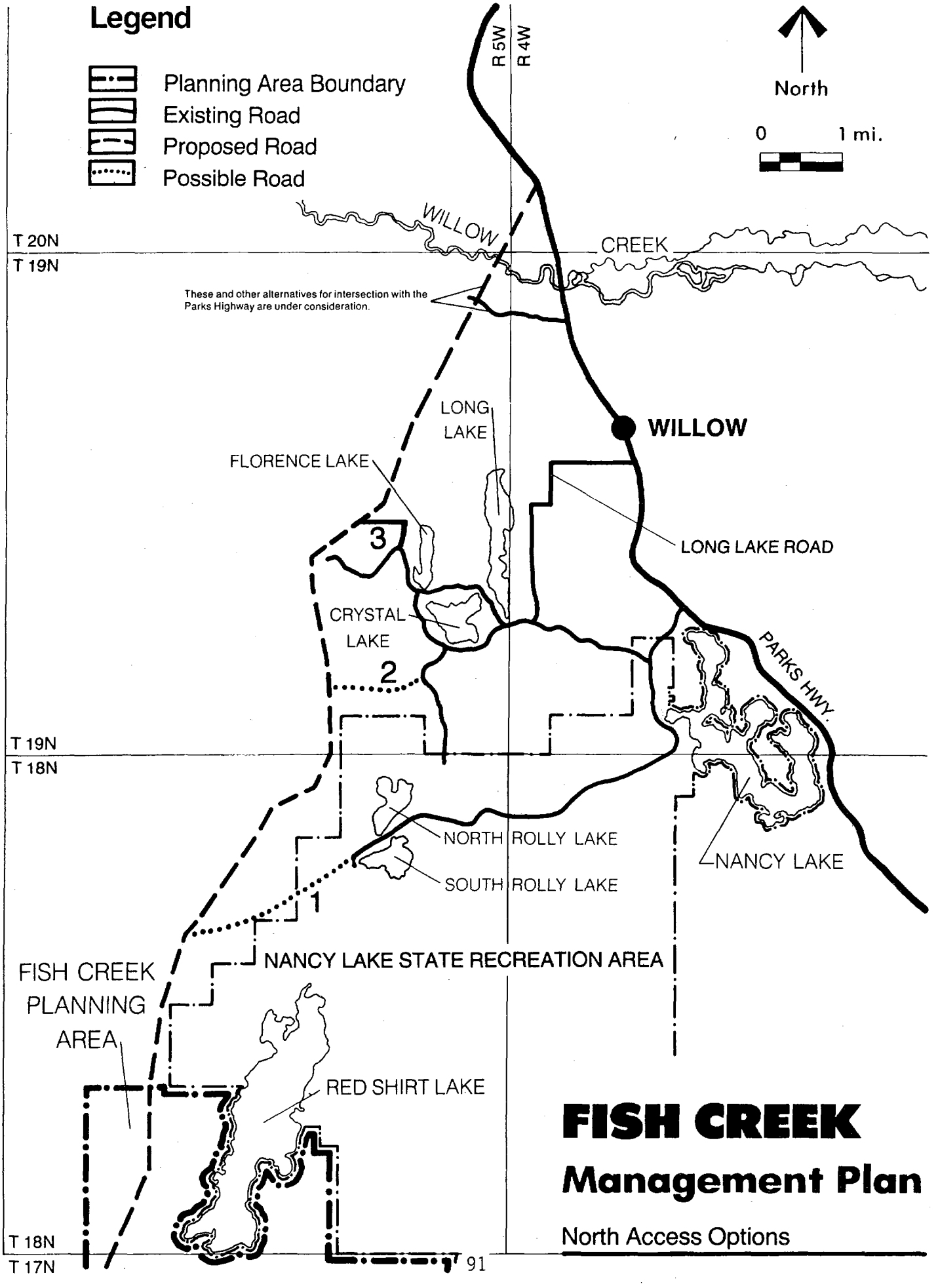

Legend
Planning Area Boundary
Existing Road
Proposed Road
Possible Road
North
0
1 mi.
R 5W
R 4W
WILLOW CREEK
T 20N
T 19N
These and other alternatives for intersection with the Parks Highway are under consideration.
LONG LAKE
WILLOW
FLORENCE LAKE
LONG LAKE ROAD
3
CRYSTAL LAKE
2
PARKS HWY.
T 19N
T 18N
NORTH ROLLY LAKE
SOUTH ROLLY LAKE
NANCY LAKE
1
NANCY LAKE STATE RECREATION AREA
FISH CREEK PLANNING AREA
RED SHIRT LAKE
T 18N
T 17N
FISH CREEK
Management Plan
North Access Options

Table 3

COMPARISON OF ALTERNATIVES FOR ACCESS TO THE FISH CREEK PROJECT

Road Options	Distance from Wasilla to project boundary (miles)	Construction within north-south corridor		Construction outside north-south corridor		Total construction	
		Distance (miles)	Cost (millions)	Distance (miles)	Cost (millions)	Distance (miles)	Estimated initial construction cost (millions) *1
North options	(to north boundary)						
Nancy Lake (1)	35.5	2.0	$ .61	2.15	$1.60	4.15	$2.21
south of Crystal Lake (2)	36.25	5.7	$1.40	1.3	$ .57	7.0	$1.97
northwest of Florence Lake (3)	39.25	8.25	$2.04	0.0	$0.00	8.25	$2.04
South option	(to south boundary)						
44' wide bridge	32.5	4.7	$4.14	0.0	$0.00	4.7	$4.14

*1 These figures should be used only for purposes of comparing the alternatives because the method used to estimate costs of the north options was different from the method used to estimate the cost of the south option. The cost figures for the north options were calculated by DNR using the Department of Transportation's 1980 unit costs as projected for the second half of 1983 by SCS. DOT's unit costs are based on 3:1 side slope. The standards agreed to for the first generation roads call for 2:1 side slope. The 2:1 side slopes are estimated to cost on the average 15% less than the 3:1 side slopes would. The above figures are therefore reduced by 15% from the DOT/SCS figures. In addition, these figures include 35% for overhead, based on Matanuska-Susitna Borough costs. DOT's overhead is estimated to be 52%. (Both the Borough and DOT's overhead percentages include preliminary engineering and contingency reserve.) The cost figure for the south option was calculated by the Matanuska-Susitna Borough. Generally, the borough's cost estimates are lower than the DNR's. Therefore, it is likely that there is a greater difference between the north options and the south option than is apparent from this chart.

crosses private property and might therefore involve additional costs. The Crystal Lake (2) access also requires building 1.3 miles of road that is not in the permanent corridor. The Nancy Lake access option (1) is opposed by the Division of Parks because of negative impacts on recreation and because federal dollars from the Land and Water Conservation Fund were used to construct the Nancy Lake Road. If this road becomes part of the state or borough road system, the Land and Water Conservation funds would probably have to be repaid to the federal government. The cost figures given in the table for the Nancy Lake road option include $286,000 which is the federal share of the road construction costs. It is possible that the state would have to repay as much as $760,000, the total amount of Land and Water Conservation funds in the Nancy Lake Recreation Area. Alternatively, the federal government could require replacement, at current costs, which would be still more expensive. In addition to the problems, the Nancy Lake access option requires the greatest amount of construction outside the permanent corridor.

The final decision on the location of the initial access to the Fish Creek project will be made during implementation and will probably depend in part on the amount of funding available for road construction.

Survey

Funding is needed for survey of the tracts. The total survey project is estimated to require 275 person months, working 6 day weeks.

Administration

Funding is also needed for administration of the sale for the Divisions of Land and Water Management and Agriculture and the Matanuska-Susitna Borough. In addition, the Division of Forestry requires funding in order to be able to provide assistance to farmers wishing to sell their timber, and the Department of Fish and Game needs funding to be able to assist with field identification of problems to be addressed in farm conservation plans.

Land Sale

At this time the state and borough plan to hold two separate but coordinated sales. The sales will be held separately if the state and borough offer different sale terms because it will be less confusing to prospective purchasers. If the sales are separate, they will be coordinated and will be held within a month of each other if at all possible.

Table 4

FISH CREEK INITIAL IMPLEMENTATION BUDGET
PRELIMINARY ESTIMATE

Road Construction, Phase 1 *1 (based on access from the south)	$17.00 million
Baseline Studies (sand and gravel, water, and wind studies)*2	.6
Survey of agricultural tracts	2.2
Administrative costs (sale preparation and monitoring)	.3
Total	$20.01 million *3

*1 Road construction costs were estimated by the Matanuska-Susitna Borough. Phase 2 roads are estimated to cost $2.22 million. This cost breakdown of $17,000,000 for phase 1 roads and $2,220,000 for phase 2 roads assumes that all primary roads are built in phase 1. The road phases map (page 77) shows about 2 1/3 miles of primary road as phase 2. If this 2 1/3 miles were not built until phase 2, the initial construction costs for phase 1 become approximately $16,370,000 and phase 2 $2,850,000.

*2 This does not include costs of the archeological study (minimal if done in conjunction with the sand and gravel inventory), the instream flow study, the wildlife and bird population study, or the pesticide residue sampling.

*3 This does not include costs of bringing electricity to the farms. The Matanuska Electric Association estimates that cost to be an additional $6.27 million. These costs may be met either by a legislative appropriation or by those being served or a combination of sources.

Appendix

Financial and Economic Analysis

This section is a summary of the findings of a draft report by the Division of Agriculture, entitled Fish Creek Agricultural Area Financial and Economic Analysis. This summary is divided into two parts, a financial analysis and an economic analysis. The financial analysis examines the possible financial effects of farming in Fish Creek to the individual farmer. The economic analysis examines the economic effects on society as a whole by looking at the benefits and the costs of the project.

Financial Analysis

Assumptions. In developing this analysis, it was necessary to make several assumptions. The first and most basic assumption is that mixed crop farms are essential for development of viable agriculture at Fish Creek because: 1) mixed-crop farms allow more efficient utilization of equipment, 2) labor and weather constraints are more easily mitigated since in most years cultural and harvest activities for several crops can be spread throughout the season (a major caveat here is that the farmer must know the characteristics and requirements of his crops and the local weather patterns in order to make the best possible management decisions), and 3) market opportunities will be limited for high value and difficult-to-grow crops (such as vegetables and potatoes). Single-crop farms (e.g. barley or other grains) generally occur either on very large acreages in regions where the climatic "windows" during which each activity must be accomplished are bigger in most years than those that exist in Alaska, and/or where acquisition of as much equipment and/or labor as is needed is not a problem. In addition, the Fish Creek area is not topographically well-suited for very large farms.

A second assumption is that 1000 acres of potatoes will be grown at Fish Creek which by the year 2000 may be one-half of the acreage needed to meet in-state demand for potatoes; 150 acres of vegtables will be grown; and remaining agricultural soils will be planted in hay, grain or pasture.

A third assumption is the cost of the agricultural rights to the land. The figures below assume a cost of $100 per acre. Actual costs for state lands will be determined by an appraisal immediately prior to the sale. $100 per acre is estimated as the low end of the possible price range.

A fourth assumption is that everyone who purchases a parcel will be a serious farmer interested in getting his tract into production as quickly as possible. However, it is also assumed that one-third of the farmers will elect to harvest their timber and take advantage of the option to delay their agricultural development schedules three years, resulting in harvest of one-third of the timber on the tracts.

A fifth assumption is the mix of crops on farms of varying sizes. For purposes of this summary, the analyses of four sample farms and crop mixes are described. The farm names are those used in the longer report.

The following describes four hypothetical farms of varying sizes with different crop mixes. An analysis of the return from these farms forms the basis for the financial and economic analysis. The return is described as the internal rate of return (IRR) which is the average annual rate of return on the capital invested in the project over the period analyzed. The period used in this analysis is 47 years. The first farm (Farm Revision #1 in Div. of Agriculture's report) has 40 acres in potatoes and 40 acres in annual hay every year. Its IRR is 8.59 percent with potatoes at $10.00 per hundred pounds (cwt.) and 38.5 percent if potatoes are valued at $18.62 per cwt. Adjusting the land charge to reflect a borough land sale and setting the price of potatoes at $10.00 per cwt., the IRR becomes 7.44 percent. (The assumed borough land charge is based on prices paid for parcels of less than 100 acres in the October, 1982 borough land sale. The land charge used was $51.42 per acre during each of the first five years, $68.56 per acre in the sixth year, and zero after the sixth year).

The second farm (Farm Revision #3) is a mixed crop farm with 150 acres of hay, 80 acres of barley, 60 acres of potatoes, and 10 acres of vegetables. If potatoes are priced at $10.00 per cwt. the IRR is 17.17 percent; with potatoes priced at $18.62 per cwt. the IRR becomes 40.79 percent. If land charges are adjusted to reflect a borough land sale the IRR declines to 15.87 percent (assuming potatoes priced at $10.00 per cwt. and an annual land charge of $29.27 per acre for the first five years and $36.59 per acre in the sixth year).

The third farm, a 250 acre hay farm, shows a negative IRR over a 15 year period. However, if the period is extended to 20 years the rate of return becomes 2.5 percent. This farm model is believed to represent some of the development that will occur at Fish Creek because hay is a crop often favored by "part-time" farmers. It requires only seasonal work and a less costly combination of equipment than many other crops. Quality hay commands a premium price in Alaska, and the farmer has the option of expanding his enterprise to include cattle production. This is an ideal scenario for a person interested in pursuing his/her business interests elsewhere while building an equity and experience base in farming.

The fourth farm, a 600 acre farm with 350 acres in hay and 250 acres in barley (Farm Revision #2) has an IRR of 2.43 percent.

Although it cannot be expected that these arbitrary farm models represent the optimal combination of crops for profit maximization and efficient farm management, they do illustrate the fact that there are crop combinations that show farming as an attractive long-term investment.

Economic Analysis

Assumptions. Transferring the analysis from the farm level to the project level requires that assumptions be made as to the mix of sizes and types of farms that are likely to be developed at Fish Creek. It is assumed that no more than 1000 acres of potatoes will be produced at Fish Creek. By the year 2000, this might amount to one-half of Alaska'a total acreage in potatoes. Fish Creek farmers will have to be very competitive to achieve this share of the fresh potato market.

It is estimated that the market constraint on vegetables will limit Fish Creek farmers to a total of 300 acres. Development of a year-round vegetable industry--including a processing plant, storage, and vigorous marketing efforts--might allow vegetable acreage to increase. This limitation also is intended to reflect production restrictions due to the high labor costs and specialized knowledge and dedication that are required for successful vegetable farming.

Although there are many other specialized crops that can be produced in Alaska, little historical data is available. It is thus assumed that all land that is not used to produce potatoes or vegetables will be planted in hay, grain, or pasture. After the Fish Creek agricultural area is in full production, it is estimated that there will be approximately 12,800 acres of grass and grain hay and pasture, 2,550 acres of barley and other feed grains, 1000 acres of potatoes, and 150 acres of vegetables. For the purposes of this analysis, it is assumed that the Fish Creek agricultural area will have ten small farms with 80 acres in production (each with 40 acres of potatoes, 35 acres of annual hay, and 5 acres of vegetables), ten medium-sized farms with about 300 acres in production (each with 150 acres of hay, 80 acres of barley, 60 acres of potatoes, and 10 acres of vegetables), 34 250-acre hay farms, and 7 large farms of approximately 600 acres (each with 350 acres in hay and 250 acres in barley). This is a total of 61 farms. (This total is based on a draft version of the plan; the selected alternative has 55 farms; it is not expected that this would significantly alter the conclusions.)

Employment effect. Based on the labor factors for Alaskan agriculture (USDA, 1983) and the number of acres projected for each crop once full production is reached, total future employment (person years) for the Fish Creek agricultural area has been calculated at 41. If 60 percent of the annual working hours are available for seasonal work, then jobs for 68 seasonal employees can be anticipated.

Income effect. Based on the previously described development scenario, total net farm income in the fifth year is estimated at about $280,000, increasing to approximately $1.3 million in the eighth year, and $3.3 million for each of the eleventh through fifteenth years. Using the Alaska agricultural income multiplier of 1.873 (USDA 1983), the total income effect in each of the eleventh through fifteenth years of agricultural development at Fish Creek is estimated at approximately $6 million.

Benefit/cost analysis. Benefit/cost analysis is a commonly used method for determining the change in well-being which 'society as a whole' will experience due to a development project. The analysis evaluates both the costs and returns from the project over its life. Development projects typically require large capital improvements during the first few years followed by an often gradually increasing cash flow every year for many years. Benefit/cost analysis addresses the question of whether the cash flow that results from the project is large enough to rationalize investing the amount of capital that is needed at the outset.

Benefits are calculated as the sum of the gross receipts from farm production and the salvage value of equipment that is replaced. Transfer payments (the transfer of dollars from one section of society to another) are not included in the calculation of benefits because they do not contribute directly to

increased production. Loan receipts are transfer payments and are thus not included in the gross receipts from production.

Costs include both capital costs (off-farm and on-farm) and operating costs. The major off-farm capital expense is road construction which is estimated at approximately $19.2 million, based on figures supplied by the Matanuska-Susitna Borough. It is assumed that the access roads and phase 1 roads will be constructed in the year preceding the first year of farm development and that phase 2 roads will be constructed in the fifth year. Sixty percent of road construction and maintenance costs are allocated to agriculture in this analysis (sixty percent is an arbitrary figure; it is based on the assumption that other benefits will be gained from road construction, primarily recreational). On-farm capital costs are investment in farm buildings, land clearing, and equipment. Cost of land is not included because it is a transfer payment. Other costs include surveying, baseline studies, and administrative costs of sale preparation and monitoring.

Road maintenance is an annual expense and was estimated based on a factor of $8000 per mile, assuming approximately 54 miles of road (figures supplied by the Matanuska-Susitna Borough).

Benefits and costs were calculated for a 47 year period, and the net benefits (benefits minus costs) were calculated for each year. The overall average annual rate of return for the 47 year period is 9.47 percent. (This assumes that all project investment and operating costs have been recovered and that the project could in addition pay 9.47 percent annual interest for the use of the capital.) It would be advisable to do a sensitivity analysis, varying the assumptions, to check on the validity of the 9.47 percent figure.

Alternate Master Plan

During the preparation of the Fish Creek Plan two alternative master plans were developed. The major difference between the two was the location of the north-south primary road. This in turn dictated some differences in the tract layout, the east-west corridor, and the secondary roads. In the selected master plan (originally alternative one) this north-south road is located along the western toe slopes of Moraine Ridge. In the alternate master plan (originally alternative two) this road is located further west, through the agricultural area. Though the Department of Transportation and Public Facilities located both corridors, they prefer the location in the alternate master plan. The selected master plan was chosen by the Department of Natural Resources and the Matanuska-Susitna Borough because of land use considerations that are outlined in the transportation section of Chapter Three.

In its comments on the public review draft of the Fish Creek Management Plan, the Department of Transportation and Public Facilities said:

> "Another issue is which alternative should be selected for the north-south primary access route. During the public meeting on this draft plan the Matanuska-Susitna Borough Planning Department and the Borough Planning Commission took the position that Alternative #1 was their preferred alternative, assuming approximately equal costs for construction and maintenance.
>
> As in most road alignments, this one involves trading off various advantages and disadvantages to select the preferred alternative. In order to select a preferred alternative, the primary function the route is being selected to serve should clearly be identified. As stated in the draft plan, while this road will initially be an agricultural access road, it can be expected to become a major north-south arterial between the Pt. MacKenzie area and the Parks Highway. The timing of this transition will depend on the construction of the Knik Arm Crossing and the upgrading of these roads from resource development to highway standards. For this reason, we believe the primary functional objective of this alignment should be to serve as an arterial between the Pt. MacKenzie area and the Parks Highway.
>
> In satisfying this objective, we believe that Alternative #2 is superior. Our recommendation is that Alternative #2 be selected as the preferred corridor alignment in the Fish Creek Management Plan given the present level of limited materials and engineering data available to base this decision on. It is important to realize that this alignment will probably define the route of a future highway for the functional life of the right-of-way, rather than the functional life of any interim road.

The following factors should be considered in association with our corridor alignment recommendation:

1. Cost: We expect there will be substantial public pressure to upgrade this road to highway standards once it has been initially constructed. The information we have at present indicates that Alternative #2 will be less expensive to upgrade than Alternative #1.

   The data to base reliable cost estimates on is lacking. Mr. Tom Young, the Borough engineer responsible for developing the cost estimates in the plan, believes his cost estimates can be assigned an accuracy range of ± 25%. Preliminary cost estimates developed by the DOT&PF are expected to be within an accuracy range from 25% over to 75% under the actual cost. As stated on page 74 of the (draft) plan, the depth of top soil and the proximity of gravel to each alternative alignment has not been determined or incorporated into the cost estimates. Both of these factors are important in developing reliable cost estimates.

   The purpose of noting the accuracy range of preliminary cost estimates is to point out that there may be significant cost differences between these two alternatives which will not be known until the materials and preliminary engineering analysis has been conducted. Because of this uncertainty on ultimate costs, we would recommend that the preliminary engineering and materials identification be completed before the agricultural parcels are sold.

2. Land Use Compatibility: The land use compatibility issue is a composite of advantages and disadvantages regarding each alternative.

   Alternative #1 would have the advantage of aligning the primary north-south access route closer to an area the Matanuska-Susitna Borough is considering for residential development. This would allow more direct residential access. The proposed residential area could also expect to experience greater noise and dust impacts with Alternative #1. This alternative would provide a boundary between agricultural and residential uses. However, the effect of this boundary would probably be minimal in separating the actual conflicts between residential and agricultural uses. The primary incompatibilities between agriculture and residential land uses are dust, odors, pesticides, herbicides and water pollution from agricultural operations as well as trespass on agricultural land by individuals from the residential area. The magnitude of these conflicts would be largely unaffected by which alignment alternative is selected.

   Alternative #2 would result in a more centralized access alignment for the agricultural operations, but a less direct access for the proposed residential uses. It would also result in bisecting the agricultural area. This alternative would provide statutory protection to both sides of the north-south alignment through the agricultural area from traffic congestion created by future commercial and residential development along the route. Agricultural land use is highly compatible with a limited access highway. It can provide highway travelers with attractive viewsheds as well as

helping preserve functional characteristics of the highway, while providing access to the agricultural parcels.

3. Design and Construction Standards: The horizontal and vertical alignment of Alternative #2 results in fewer and more gradual curves and consequently better sight distance than Alternative #1. At the 65 MPH design speed, 2300 feet of sight distance is the minimum required for passing. This factor will become increasingly important for traffic safety as the traffic volume increases. Traffic volumes can be expected to increase substantially as this route evolves from primarily an agricultural access road to a major arterial. It appears that Alternative #2 can generally meet the design requirements for a 65 mile per hour (MPH) design speed. Alternative #1 would not meet the criteria for rural highways over level ground."

Following receipt of these comments they were discussed in a meeting attended by representatives of the Department of Natural Resources, the Matanuska-Susitna Borough, and the Department of Transportation and Public Facilities. The compromise agreed to was that the plan would make clear that more information was needed before the decision on the selected route could be considered final and would leave the door open to reconsidering the alternate route. For this reason the following information adapted from the public review draft is presented here. It includes the alternate master plan, a chart analyzing the agricultural tract acreages in the alternate plan, and a comparison of the two primary road systems.

Comparison of Alternative Road Systems

A chart on the next page compares the alternative primary road systems. The selected alternative is preferred by the Matanuska-Susitna Borough, the Department of Natural Resources, and the Matanuska-Susitna Agricultural Advisory Board. The soils crossed by the selected corridor are less valuable for agriculture than those crossed by the alternative corridor. Also the selected corridor is not as disruptive to the farm tract layout; generally, it forms the boundary between the agricultural tracts to the west and the settlement lands on the Ridge. (See also the Transportation Section in Chapter 3.) The alternate corridor is preferred by the Department of Transportation because the terrain it crosses is better for building roads. It is flatter, allowing for a straighter alignment, and the top soils are shallower. Also the alternate corridor fits better with the main east-west corridor. The north-south road in the selected corridor is slightly shorter, but overall the primary system in this alternative is longer because of the additional length of the east-west road. According to preliminary cost estimates, the primary road system in the selected alternative will cost about $600,000 more to build due to the more difficult terrain in the north-south corridor and the greater length of the east-west road. However, when costs for both primary and secondary roads are considered, the selected alternative costs only $150,000 more to build. This was not considered a significant difference.

Table 5

COMPARISON OF ALTERNATIVE PRIMARY ROAD SYSTEMS

CRITERIA	ALTERNATIVE 1 NORTH-SOUTH ROAD VIA MORAINE RIDGE	ALTERNATIVE 2 NORTH-SOUTH ROAD VIA AGRICULTURAL AREA
General soils	Deeper top soils (more susceptible to frost heaves); gravelly, course sand subbase.	Shallower top soils, sandy sub-base.
Agricultural soils included in primary road system		
Class II	511 acres	600 acres
Class III	244 acres	115 acres
Total Class II & III	755 acres	715 acres
Slope, North-South Road	5.75 miles of slopes over 7%; of that, 1.58 miles over 12%; greater amount of cut and fill necessary to minimize grades; more susceptible to erosion.	2.24 miles of slopes over 7%; of that, 0.5 miles over 12%.
Slope, East-West Road	0.83 mile over 30%.	0.85 mile over 30%.
Stream crossings	One major stream crossing (Fish Creek).	Several stream crossings (including Fish Creek).
Length North-South Road	12.3 miles	12.4 miles
Length East-West Road	8.6 miles	7.1 miles
Length of primary system	20.9 miles	19.5 miles
Initial Cost of primary system	$6.87 million	$6.27 million
Initial cost of total system	$19.22 million	$19.37 million
Alignment	Greater amount of curves resulting from topography and land status.	Straighter alignment.
Land use compatability	Road serves as demarcation between agricultural area and residential area.	Road goes through agricultural lands.
	Road closer to residential area, giving faster access and more impacts.	Road is further west which gives future traffic from west (e.g. Beluga) a shorter route to Fairbanks.
	Places intersection with Beluga corridor at the south end of Moraine Ridge where future commericial/industrial development is to occur.	Places intersection with Beluga corridor in the agricultural area.
	55 agricultural tracts.	59 agricultural tracts.
Effect on private lands	Crosses two parcels.	Does not cross parcels.

A question that is not really addressed in the chart is the proximity of gravel to each route. This requires more field work to answer. Generally, gravel deposited by a river is better for road construction than gravel deposited by a glacier because of the silt mixed with the latter. The Soil Conservation Service's Susitna Valley Soil Survey indicates that there should be gravel under the top soil along the Moraine Ridge route. If there is, it may be possible to use it for road construction, but it may be mixed with silt and therefore be less desirable. More likely sources of good, washed gravel are the Bernice soils which lie along the streams. There are more of these along the route of the alternate corridor.

Two factors contribute to the possible greater cost of the route along the toe of Moraine Ridge: the steeper slopes and the deeper top soils. The method used for calculating costs did differentiate among slopes but not among top soil depths. Therefore the cost for the selected route may be higher than indicated.

This analysis is based on preliminary information. The soils information is from the Soil Conservation Service as published in the Soil Survey, Susitna Valley Area, December, 1973. Inaccuracies are possible in both the soils information and the cost estimates. Accurate cost estimates cannot be obtained without a preliminary engineering study which has not been funded to date.

Management Guideline

The following is a management guideline which applies to the alternate master plan.

If Alternative Two is selected the location of the north-south corridor in Section 8, Township 16 North, Range 5 West or the location of the Iditarod Trail corridor should be adjusted during survey, if necessary, to minimize the impact of the road on the trail. The crossing should be as close to right angles as possible and overlap in the corridors should be kept to a minimum. It may be necessary to move the curve in the highway slightly south to accomplish this.

Table 6
FISH CREEK
AGRICULTURAL TRACT ACREAGES
(Approximate)*
Alternate Master Plan

TRACT #	CLII	CLIII	CLIV	CL II & III	Wetlands	Roughlands	TOTAL	% CLII, III SOILS IN TRACT
1	--	228	122	228	83	--	436	52%
2	--	256	37	256	12	5	314	81%
3	20	366	6	386	55	4	461	84%
4	611	2	7	613	12	25	656	93%
5	425	--	44	425	16	31	516	82%
6	616	8	22	624	154	41	845	74%
7	316	--	--	316	1	15	331	95%
8	68	--	--	68	--	1	69	99%
9	154	14	9	168	--	2	180	94%
10	150	25	28	175	29	7	240	73%
11	263	--	81	263	21	11	377	70%
12	504	--	--	504	--	9	514	98%
13	184	--	6	184	--	16	208	89%
14	116	--	--	116	--	2	118	98%
15	64	259	85	323	25	11	445	73%
16	--	276	32	276	12	1	324	85%
17	16	384	15	400	13	14	442	91%
18	483	--	--	483	3	42	529	91%
19	294	219	9	513	29	11	564	91%
20	324	42	--	366	--	4	370	99%
21	44	130	--	174	40	13	229	76%
22	256	177	101	433	160	32	747	58%
23	7	174	5	181	22	1	209	87%
24	9	187	57	195	37	3	295	66%
25	607	9	30	616	41	6	696	89%
26	181	--	--	181	17	--	199	91%
27	465	37	11	502	30	7	557	90%
28	156	--	--	156	4	2	164	95%
29	16	51	--	66	6	8	81	82%
30	211	215	163	426	93	19	703	61%
31	350	--	3	350	43	32	428	82%
32	484	11	25	495	72	23	631	78%
33	146	--	33	146	24	--	212	69%
34	400	--	--	400	19	9	428	93%
35	223	--	--	223	53	6	283	79%
36	230	--	30	230	82	--	345	67%
37	111	--	6	111	44	1	162	69%
38	70	--	--	70	3	--	73	96%
39	134	--	--	134	28	--	163	82%
40	67	--	67	67	29	--	163	41%
41	84	--	8	84	--	--	92	91%
42	81	69	--	150	41	8	203	74%
43	55	59	3	114	27	25	169	67%
44	330	64	41	394	69	26	530	74%
45	203	--	4	203	5	8	220	92%
46	104	--	36	104	44	3	187	56%
47	74	85	156	159	34	32	382	42%
48	--	206	87	206	36	71	400	52%
49	209	121	--	330	107	--	438	75%
50	58	71	16	129	9	4	158	81%
51	37	13	16	50	9	--	76	66%
52	94	--	31	94	15	--	140	67%
53	22	--	--	22	--	--	22	98%
54	168	--	11	168	16	13	208	81%
55	156	--	5	156	32	15	220	71%
56	27	92	50	119	26	8	211	57%
57	200	79	--	279	39	--	319	88%
58	201	11	25	212	41	--	286	74%
59	68	--	118	68	22	39	257	27%
MR1	--	74	--	74	30	--	105	71%
MR2	--	85	43	85	7	8	142	59%
MR3	--	118	--	118	--	7	125	94%
BOROUGH	6,785	3,864		10,649			13,536	
STATE	4,681	646		5,329			7,214	
TOTAL	11,466	4,510	1,739	15,978	2,110	886	20,750	

* Acreages are approximate because they are calculated from data represented at 1:63,360; precise acreages will not be available until the tracts are surveyed. Acreage included in secondary roads (100 ft. corridors) has not been subtracted out of tracts. Discrepancies between the total of the categories and the total acreage in the tracts is generally due to water and imprecision in the data.

Legend

- Planning Area Boundary
- Private Land
- Intensive Settlement
- Non-intensive Settlement
- Agricultural Tract
- Public Recreation
- Public Retention
- Primary Road
- Secondary Road
- Trail

Susitna Corridor Management Unit

Nancy Lake State Recreation Area

MR1

MR2

MR3

T 18N

T 17N

Homestead Creek

Moraine Ridge Management Unit

Iditarod Historic Trail

Burn's Cabin

Hock Lake

T 17N

T 16N

Little Susitna Corridor Management Unit

R 7W R 6W

Flathorn Lake

Alternate Route

R 6W R 5W

Susitna Flats State Game Refuge

Susitna Hydroelectric Transmission Line—Proposed

North

0 1 mi.

FISH CREEK
Management Plan

Alternate Master Plan

Legend

- Planning Area Boundary
- Private Land
- Agricultural Tract
- Public Recreation
- Primary Road 1st Phase
- Secondary Road 1st Phase
- Primary Road 2nd Phase
- Secondary Road 2nd Phase
- Secondary Road 3rd Phase
- Trail
- Trail Realignment

Susitna Corridor Management Unit

Nancy Lake State Recreation Area

T 18N

T 17N

Homestead Creek

Moraine Ridge Management Unit

Iditarod Historic Trail

Burn's Cabin

Hock Lake

T 17N

T 16N

Little Susitna Corridor Management Unit

R 7W R 6W

Flathorn Lake

R 6W R 5W

Susitna Flats State Game Refuge

Susitna Hydroelectric Transmission Line—Proposed

North

0 1 mi.

FISH CREEK

Management Plan

Alternate Road Phases

Participants in Fish Creek Planning Process

The following people from the private sector commented on the Fish Creek Plan or contributed information.

Gregory Bill, Iditarod Trail Committee, 12231 Mary Avenue, Anchorage, Alaska 99515

Cliff Eames, Alaska Center for the Environment, 1069 West 6th Avenue, Anchorage, Alaska 99501

Wayne Lampshire, 317 Wood Bluff, Lafayette, Louisiana 70503

Tracy Moffit, Matanuska-Susitna Borough Agricultural Advisory Board, Box 745, Palmer, Alaska 99645

Frank Parr, Box 8048, Anchorage, Alaska 99508

Deborah Robertson, SR 5297-G, Wasilla, Alaska 99687

James Seeley, President, Rolejo Lake Association, Ltd., 3531 Tanglewood Place, Anchorage, Alaska 99503

Norm Stadem, 1826 East 26th Avenue, Anchorage, Alaska 99508

Bob Thom, Matanuska-Susitna Borough Agricultural Advisory Board, Box 6007, Palmer, Alaska 99645

Excerpts from Willow Sub-basin Plan

MANAGEMENT UNIT: FISH CREEK

MANAGEMENT INTENT

The Fish Creek Unit is to be the setting for a major commercial agricultural project planned and developed jointly by the borough and state. This project will add to the size and stability of the local agricultural industry, provide additional employment, increase the local tax base, and diversify the statewide economic base. Agricultural development should be designed to protect other resource values in the unit: fish and game habitat (stream and wetland buffers); recreation (the Iditarod Trail, other trails and streamside recreation including access sites); forestry (timber salvage on agricultural lands); settlement (land of marginal agricultural potential); and small farm agriculture (where configuration of the land makes large farms infeasible). Interim management of the unit will be for forestry, fish and wildlife, recreation and other uses which do not diminish the agricultural value of the unit.

Land use designations and management guidelines are presented below for three sub-units within Fish Creek: the agricultural areas, the hydrologic system, and the Iditarod Trail.

SUBUNIT A: THE AGRICULTURAL AREA

Primary Land Use	Secondary Land Uses
- Commercial Agriculture	- Forestry (salvage) - Settlement (land of marginal agricultural capability) - Small Farm Agriculture (where topography makes large farms infeasible) - Recreation (access sites and trails)

MANAGEMENT GUIDELINES

Agriculture

To the extent feasible, class II and III soils in this unit should be sold for agricultural use. Small farm agricultural development should

be encouraged where parcel configuration or topography render large farms infeasible.

Forestry

All timber having high value for commercial and personal use shall be salvaged on lands to be cleared for agricultural purposes. See Chapter III, Goals, Policies, and Management Guidelines; Forestry, for implementation techniques.

The management plan for the Fish Creek Unit will address: (a) the implementation techniques used to assure salvage; (b) the time required for the local timber industry to accomplish salvage between the times of access development and clearing completion; and (c) the effect of the sale on the development of the forest industry.

Agricultural land disposals should be designed to provide adequate personal wood supplies for individual farmsteads.

Trail corridors identified in the Fish Creek Unit are available for personal and selected timber harvest under guidelines for Trails, Chapter III.

Settlement

Land of marginal agricultural capability, because of topography or soil limitations, may be used for settlement. In addition, residential and commercial settlement necessary to support the agricultural project or commercial recreational needs oriented to the Fish Creek drainage may be planned as necessary. Settlement should be concentrated in as few locations as possible in order to minimize both the cost of services and the impact on the agricultural land base.

Transportation

For management guidelines affecting the development of roads and other transportation facilities see Chapter III, Transportation.

Recreation

In addition to the Iditarod Trail (which is discussed in Sub-unit C), two trails are identified in the Fish Creek Unit. Each of these should be retained in public ownership with a width of 300 feet (150 feet either side of centerline). This width allows flexibility to reroute, separate motorized and non-motorized uses, and include a visual buffer. Rerouting of the trail corridor will be permitted to minimize impact on agricultural land with the provision that alternate routes provide opportunities similar to the original. In order to minimize impacts on agricultural land and to reduce management costs, rerouting to combine the trail corridor with streams, wetlands, or other recreation corridors is encouraged.

Where road corridors contact streams, appropriate areas should be retained in state ownership to accommodate the expected recreation use,

including parking. The size of these areas will vary but should generally be 20 - 80 acres. Exceptions to this size may be made for sites anticipated to have very low or high use.

Trail access to the Fish Creek system should be maintained and improved during agricultural development. Section line easements shall not be vacated unless an appropriate substitute access is provided. Provision of realistic substitute access is encouraged.

SUBUNIT B: THE HYDROLOGIC SYSTEM

Streams/Stream Buffers

Primary Land Uses	Secondary Land Use
- Fish and Wildlife - Recreation	- Forestry

Wetlands/Wetland Buffers

Primary Land Uses	Secondary Land Use
- Fish and Wildlife - Watershed	- Forestry

MANAGEMENT GUIDELINES

Location of Stream Buffers

Along Fish Creek and tributaries, wildlife/ public recreation buffers will be retained in public ownership. Each stream buffer will include all adjacent non-class II - III soils (e.g. Moose River (Mr) and Bernice (Ber) soil types) adjacent to the stream, or the buffer will be 200 feet back on either bank from the high water mark - whichever is the greater distance.

Location of Wetland/Wetland Buffers

For management guidelines governing the disposal of agricultural lands adjacent to wetlands see Chapter III, Wetlands.

Forestry

Personal use or commercial harvest in the stream or wetland buffer must be compatible with the habitat/recreation characteristics of the buffer. Negative impacts on visual character, habitat value, water quality, noise screening ability, or adverse changes in access should be avoided.

Operations inside the buffers will require coordination and on-site review with ADF&G and the Division of Parks during sale planning (including and in addition to Title 16 requirements). If significant adverse impacts cannot be avoided no sale shall occur. These guidelines should not be construed to replace the Forest Resources and Practices Act and implementing regulations which also guide operations along streams. See also Chapter III, Wetlands; Forestry Management Adjacent to Wetlands.

Transportation

For management guidelines affecting the development of roads and other transportation faciltities see Chapter III, Transportation.

Other Guidelines

Baseline hydrologic monitoring should be initiated as soon as possible on the mainstream and tributaries of the Fish Creek system. Knowledge of the impacts of the agricultural project on the quantity and quality of the stream waters will be useful in planning future projects.

SUBUNIT C: THE IDITAROD TRAIL

Primary Land Use	Secondary Land Use
- Recreation	- Forestry

MANAGEMENT GUIDELINES

Location of the Iditarod Trail

Because of the compatible nature of the Iditarod Trail uses and agricultural practices planned for this unit, a 600 foot wide (300 feet either side of centerline) public ownership corridor will be established. This width may be further reduced, and some rerouting permitted, after consultation and agreement with the Division of Parks. The Matanuska-Susitna Borough Trails Committee shall also be consulted if rerouting the trail corridor is proposed. Any reduction of corridor width will be contingent on the maintenance or enhancement of the quality of the trail experience.

No structures or equipment of a permanent nature should be placed within the trail corridor which could adversely affect the trail experience.

Trail Crossings

Where necessary, trail crossings may be permitted to allow access to lands on both sides of the trail. Crossings should be limited to a few discreet areas rather than random crossings along the length of the trail.

Forestry

Forestry guidelines for the Iditarod Trail are presented in Chapter III, Goals, Policies, and Management Guidelines; Forestry.

AREA-WIDE POLICIES AND MANAGEMENT GUIDELINES

Chapter III presents additional policies and land management guidelines which may be relevant to particular decisions in this management unit. Categories of these policies and guidelines are listed below for ease of reference:

	Pages
AGRICULTURE	41
RECREATION	53
FORESTRY	59
FISH & WILDLIFE	67
SETTLEMENT	73
SUBSURFACE RESOURCES	79
TRANSPORTATION	89
WETLANDS	97
RIVER & STREAM CORRIDORS	103
TRAILS	109
PUBLIC ACCESS	113

MANAGEMENT UNIT: MORAINE RIDGE

MANAGEMENT INTENT

° Moraine Ridge is well suited for settlement due to its well drained soils and varied terrain offering lakes and excellent views. The unit lies encircled by other management units where limited settlement is anticipated: the Nancy Lakes Recreation Area and Little Susitna Recreation Corridor, the Susitna Game Flats, and the agricultural and forestry lands of the Fish Creek and Susitna Corridor management units. Therefore, as access is developed, Moraine Ridge will be the focus of demand for settlement land in the general area and will be able to provide many excellent homesites.

° This unit has high forestry values and could provide areas for both personal use and commercial sustained yield management.

° Moraine Ridge is presently valuable for moose, bear and other species. It could support additional recreation on lakes and trails coordinated with recreation activities in the adjacent Little Susitna Corridor Management Unit and in Nancy Lakes State Recreation area.

More detailed planning is necessary to define areas where the above uses should occur. Areas of settlement and commercial forestry should be separated, possibly using personal use woodlots as buffers. Prior to road access, settlement can be located along edges of fly-in lakes. Forestry should occur in a manner that enhances habitat whereever possible.

Recommended Land Uses

- Settlement
- Forestry
- Fish and Wildlife
- Recreation

MATANUSKA-SUSITNA BOROUGH
Planning Commission Resolution 84-34

A RESOLUTION OF THE PLANNING COMMISSION OF THE MATANUSKA-SUSITNA BOROUGH RECOMMENDING THAT THE ASSEMBLY ADOPT THE FISH CREEK MANAGEMENT PLAN

WHEREAS, the Willow Sub-basin Plan adopted jointly by the Borough and the State Department of Natural Resources identified land use and management guidelines for the Fish Creek and Moraine Ridge Management Units; and

WHEREAS, the Fish Creek Management Plan has been developed jointly by DNR and Borough staff incorporating recommendations for both Moraine Ridge and Fish Creek Management Units; and

WHEREAS, the Planning Commission has reviewed the Fish Creek Management Plan, Public Review Draft, and conducted a public hearing; and

WHEREAS, the Planning Commission finds the Fish Creek Management Plan would meet desirable goals for use of Borough land in the area and would be in the public interest; and

WHEREAS, the Planning Commission has reviewed the merits of the two alternative alignments recommended in the plan for a north-south primary road and finds Alternative 1 (along Moraine Ridge) to be preferable;

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission of the Matanuska-Susitna Borough recommends that the Assembly adopt the Fish Creek Management Plan as presented in the Public Review Draft of April 1984.

BE IT FURTHER RESOLVED that the Planning Commission recommends "Alternative 1" as presented in that plan as the alignment of the proposed north-south primary road.

Reviewed and approved by the Planning Commission of the Matanuska-Susitna Borough this 14th day of May, 1984.

Robert J. Stickles
Planning Director

ATTEST:

Mary E. Utter
Planning Clerk

Index

access, discussion 2, 5, 14, 22, 25-26, 29-30, 32-33, 35-38, 39-40, 45-46, 49, 58, 60, 64, 68-73, 79-83, 89-94, 98-101; guidelines 51-53, 59, 61-63, 66-67, 73-75, 80, 83-86; primary 29-30, 39, 41, 47, 49, 70-72, 77, 83, 85, 94, 99-102, 105, 107; roads (phase 1) 13, 49, 75, 77, 90, 94, 98, 107; roads (phase 2) 13, 51, 53, 90, 94, 107; roads (phase 3) 51, 53, 73, 75, 77, 90, 107; secondary 29-30, 47, 54, 70, 72, 74, 77, 81, 85, 99-101, 104-105, 107; transportation 26-31, 70-77
ADL 57588 25, 29, 70
ADL 216410 71-72
Agricultural classification 46, 49, 64, 70
agricultural rights 10, 49, 55, 59, 95
agriculture, discussion 1-2, 5, 7, 9-10, 13, 17-18, 21-22, 25, 29-30, 35, 39-40, 45-47, 49-50, 54-56, 60, 64-65, 70, 87, 89-90, 93-101, 105; guidelines 51-53, 56-59, 61-63, 66-67, 73-75, 80, 83, 87
Anchorage 7, 18, 26, 29, 57-58, 71-72, 90, 109
appraisals 50, 56, 58, 95
archeological resources 7, 38, 89, 94
Army Corps of Engineers 61, 63, 87

baseline studies 7, 46, 53, 89, 94, 98
bears 2, 22, 34-35
Beluga coalfields 29, 70
benefit-cost analysis - see cost-benefit analysis
buffers, discussion 34, 66, 73, 86; Iditarod Trail 50; public access 52, 79, 82-83; stream and wetlands 30, 50, 52-53, 55, 59-63, 86-87
burnings 56-58
Burns' cabin 36, 38-39, 47, 77, 81, 84, 105, 107
Butterfly Lake 21, 32, 82

capability classes (soils) - see soils
Chuitna River/Goose Bay corridor 3, 25, 29, 58, 70, 74
classifications - see state land classifications
climate 9-10
coal 29, 42, 50, 70, 83, 87
coastal management 7
connecting trail 37, 85
cost-benefit analysis 7, 13, 55-56, 89, 95, 97, 98
Cow Lake 38, 40, 81-82
cutting, selective 22, 55, 58-59, 63, 65, 83

Delyndia Lake 21, 32, 38, 40, 66, 81-82
Denali - see Mount McKinley
Department of Environmental Conservation 57, 63
Department of Fish and Game 5, 7, 34, 52-53, 59, 62-63, 74, 76, 80, 86, 93
Department of Transportation and Public Facilities 5, 25, 29, 45, 70-72, 74, 84, 86, 90, 92, 99, 101

Division of Agriculture 2, 5, 10, 50-52, 55-57, 62, 86, 93, 95
Division of Forestry 5, 56-59, 93
Division of Geological and Geophysical Surveys 9, 62, 82, 86
Division of Land and Water Management 1, 5, 7-8, 36, 51-53, 56, 58-59, 62-63, 82-84, 86, 93
Division of Parks 5, 36, 38-39, 53, 58-59, 62, 76, 83-84, 93

easements 51, 53, 60-61, 75-76, 83-85
east-west road 45, 70-71, 83, 90, 99, 101-102
economics 5, 10, 14, 46, 50, 55, 73, 95-98
employment 46, 64, 97
engineering studies 45, 70-71, 74, 90, 99-100, 103

farm development schedules 50-52, 56, 98
financial - see economics
fish and wildlife, discussion 1-2, 5, 7, 17-18, 21, 32-34, 36-40, 45, 60, 72, 79-80, 87, 89; guidelines 52-53, 58-59, 61-63, 80
Fish Creek 1-2, 9-10, 18, 26, 29, 32-33, 35-40, 45, 53, 59, 61-63, 67, 72, 75, 79-83, 89
Flathorn Lake 1, 21-22, 26, 29, 32, 36-37, 39-40, 52, 62, 74-75, 79-82, 84
Forest classification 55
forest resources, discussion 5, 7, 10, 13-17, 21-22, 35, 46, 49-50, 55-56, 65, 93, 95; guidelines 51-53, 56-59, 63, 73, 83; timber harvest 5, 13-14, 17, 22, 49, 51-52, 56-59, 95
furbearers 2, 35

geology 41-43
gravel - see material resources
guidelines, discussion 1, 5, 7-8, 103

historical resources 2-3, 26, 36, 38-40, 45, 49-50, 52, 58, 67, 75, 80-81, 83-85, 103
Hock Lake 21-22, 38, 40, 66, 81-82
Homestead Creek 32-33, 37, 62, 67, 79, 83
hydroelectric transmission line 31, 75

Iditarod Trail 2-3, 26, 36, 38-39, 45, 49-50, 52, 58, 67, 75, 80-81, 83-85, 103
implementation 7-8, 72, 89-94

Knik Arm crossing 29, 71-72, 90, 99

land cover 1, 15
land status 3, 8, 29
Little Susitna River 1, 7, 21-22, 26, 32-38, 65, 72, 76, 89, 90

management decisions 1, 8, 45-87
Master Plan 5, 7, 31, 45-47, 52, 54, 60, 62, 64, 67, 70, 73, 75, 79-84, 99, 101 103-104
Matanuska Electric Association 13, 94
Matanuska-Susitna Borough 1-2, 5, 7-8, 29, 39, 45, 49, 51-53, 57-59, 61, 63-65 70-72, 74, 84, 86-87, 90, 92-94, 98-101, 116

Material classification 86
material resources, discussion 7, 29, 41, 49-50, 86, 89-90, 94, 99-100, 103; guidelines 52, 74-75, 86
Mineral classification 87
minerals - see subsurface resources
moose 2, 17, 22, 34-37, 39
Moraine Ridge 1, 21-22, 25-26, 29-30, 34-35, 37-38, 45, 55, 59, 64-66, 71-75, 81, 90, 99, 102-103
Mount McKinley 22, 40, 73
Mount Susitna 22, 37, 40, 73

Nancy Lake Loop trails 37, 58, 84
Nancy Lake Road 72, 90, 93
Nancy Lake State Recreation Area 1, 21, 32, 36-38, 58, 65, 72, 84, 90, 93
north-south road 26, 29-30, 37-38, 41, 45, 50, 70-71, 73-75, 83, 89-90, 92, 99-103

oil and gas - see subsurface resources
Oil and Gas classification 87

Parks Highway 25, 29, 45, 71, 90, 99
planning process 1, 5-8, 63
planning team 5, 7, 30
Point MacKenzie 1-2, 5, 10, 14, 22, 25, 29-30, 45, 58, 65, 70-73, 90
Point MacKenzie/Willow Road 10, 25, 29-30, 45, 58, 65, 70-72, 90
public recreation - see recreation
Public Recreation classification 38, 40, 81, 83

railroad corridor 25, 30, 72-73
recreation, discussion 1-2, 5, 7, 13, 17-18, 21, 29, 32-33, 36-40, 45-47, 55, 60, 64-65, 68, 72, 77, 79-84, 87, 90, 93, 98, 105, 107; guidelines 52-53, 58-59, 61-63, 66-67, 75-76, 80, 83-85
Redshirt Lake 21, 26, 29, 32, 38, 40, 75, 80, 82
right-of-way 29, 31, 51, 58, 70-76, 81, 99
roads - see access

salmon - see fish and wildlife
sand and gravel - see material resources
seismic lines 26-27, 36-39
settlement, discussion 21-25, 45, 47, 64-65, 68-70, 87, 101, 105; guidelines 66-67, 74-75
Settlement classification 64
slope 9, 21-23, 30, 62, 71, 74, 90, 92, 99, 102-103
small game 2, 35
Soil Conservation Service 5, 9, 45-46, 52, 92, 103
soils, discussion 1-2, 5, 9-10, 13, 21-22, 29-30, 46, 50, 52, 57, 64, 73-75, 95, 100-102; capability classes 1-2, 9-11, 21-22, 46, 49-50, 54, 60-62, 65, 67, 74, 81, 84, 87, 102-104; soil surveys 9, 45, 103
state land classifications 8, 38, 40, 46, 49, 55, 60, 64, 70, 79, 81, 83, 86-87
stream corridors, discussion 5, 26, 33, 35, 45, 60, 87; guidelines 52, 61-63, 79; see wetlands
subsurface resources, discussion 42, 50, 87; guidelines 57, 83, 87

Susitna Corridor 34-36, 67, 73, 75
Susitna Flats State Game Refuge 1, 21, 29, 34, 36, 39-40, 74
Susitna Flats trails 37, 85
Susitna River 1, 7, 10, 14, 22, 25-26, 29, 34, 36-37, 40, 67, 70, 75, 84

timber - see forest resources
trails, discussion 2, 22, 26-29, 36-39, 45, 47, 49-50, 68-70, 77, 81, 83, 103, 105, 107; guidelines 52-53, 58, 66-67, 73, 75, 80, 83-85
transportation - see access
Transportation Corridor classification 70

views, discussion 22, 37, 39-40; guidelines 73, 75-76, 83-84

Wasilla 7, 9, 58, 72, 92
water, discussion 2, 7, 9-10, 18, 22, 30, 32-34, 38, 40-41, 45, 64-66, 82, 87, 89, 94, 100; guidelines 52-53, 61-63, 80
waterfowl 2, 18, 34-36, 39-40
wetlands, discussion 2, 5, 10, 18-19, 21, 26, 30-31, 34-37, 45, 49-50, 54-55, 60, 79, 81, 104; guidelines 52-53, 59, 61-63, 67, 84, 87
wildlife - see fish and wildlife
Wildlife Habitat/Public Recreation classification 64, 79, 83
Wildlife Habitat/Water Resources classification 60, 64, 70, 79
Willow 22, 25, 29, 45
Willow Sub-Basin Area Plan 1-2, 5-7, 21, 35, 37, 39, 50, 60, 62, 81, 83-84, 110-115
windbreaks 50-52, 56, 59, 89

Yohn Lake to Susitna River Trail 37, 58, 67, 84